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OIL AND GAS JOURNAL

BRUARY 26
1942

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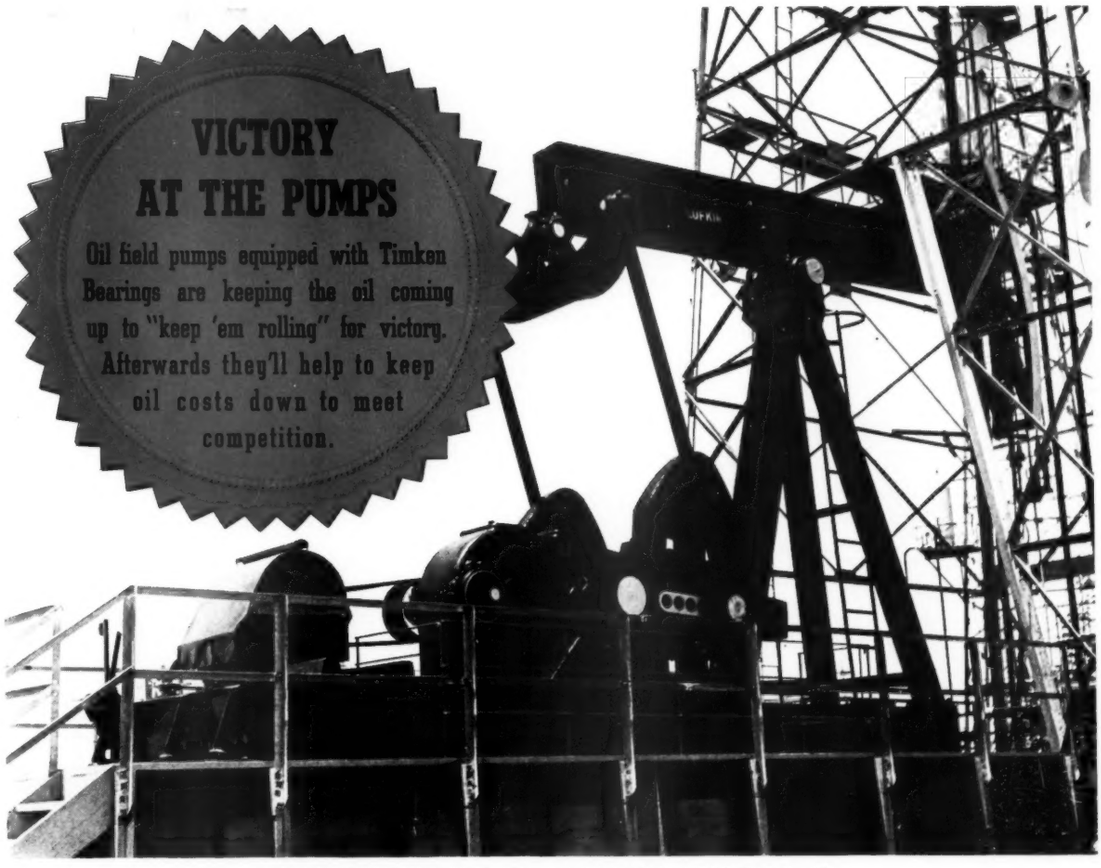

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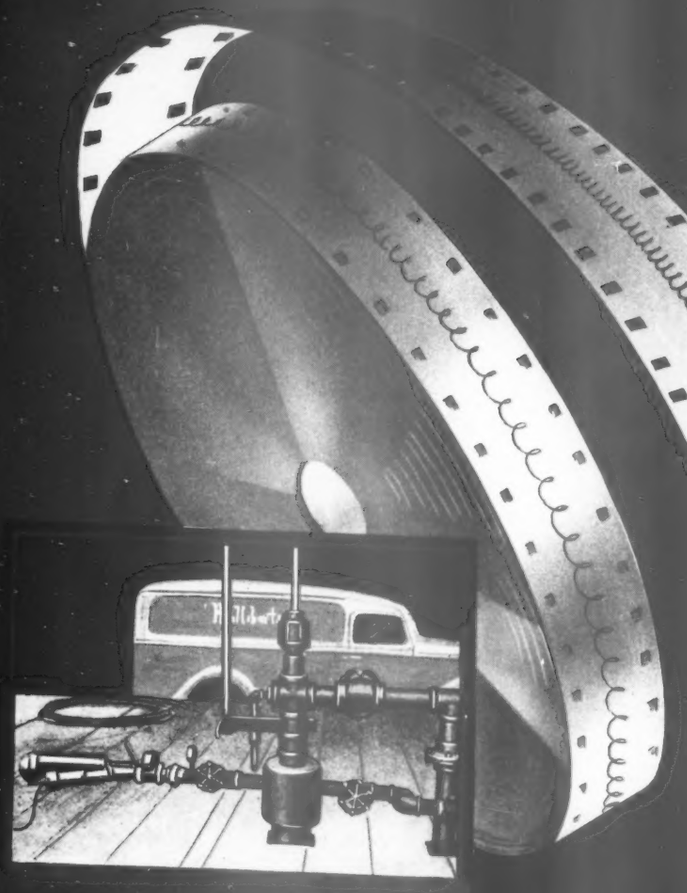

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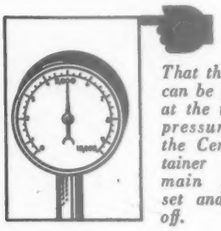

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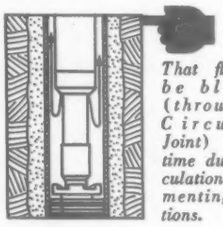

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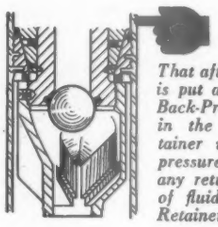

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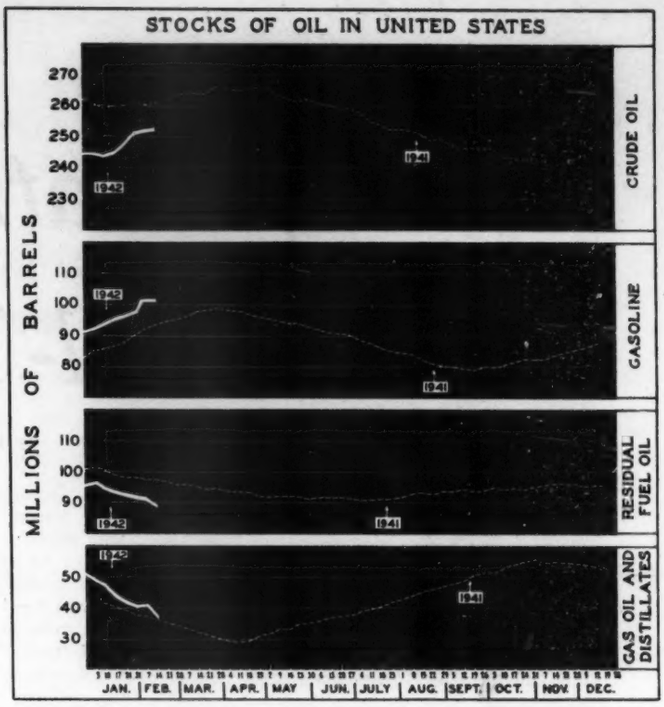
Trends

Domestic Operations Faced With Important Transportation Shifts



AS the second month was drawing to a close, transportation problems were uppermost in the minds of operators not only in this country but also in the entire Western Hemisphere and in other areas dependent on the western part of the world for their petroleum supplies. Probably no problem of the past which the domestic industry has been called upon to solve, had as many ramifications. Trends in crude-oil production, refining and marketing during March will be largely dependent on what the industry, in cooperation with Washington officials, is able to work out in the solution of transportation difficulties.

CRUDE PRODUCTION *4,077,475 bbl. daily average—up 6,415 bbl. One year ago 3,627,665 bbl.*

CRUDE STOCKS *254,463,000 bbl. as of February 14 — up 2,097,000 bbl. One year ago 260,948,000 bbl.*

GASOLINE STOCKS *101,796,000 bbl. as of February 14—up 1,572,000 bbl. One year ago 93,801,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *89,955,000 bbl. as of February 14—down 904,000 bbl. One year ago 97,479,000 bbl.*

GAS OIL AND DISTILLATES *37,512,000 bbl. as of February 14—down 2,526,000 bbl. One year ago 36,482,000 bbl.*

REFINERY RUNS *3,772,000 bbl. daily week ended February 14 — down 81,000 bbl. One year ago 3,606,000 bbl.*

Note: A.P.I. figures for stocks of gasoline, residual fuel oil, gas oil and distillate, and refinery crude runs not available for week ending February 21.

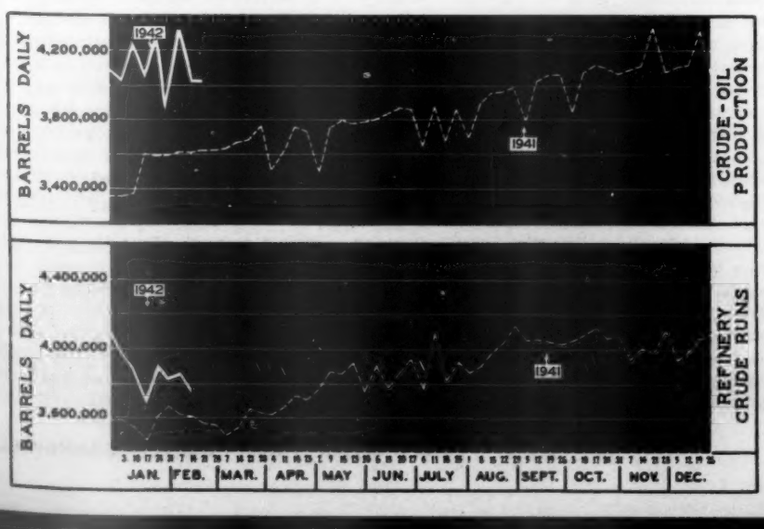
The latest developments in transportation and what is being done in the efforts to maintain operations as near normal as possible, are explained in this issue. Briefly the present situation arises from the curtailment of tanker shipments in practically all waters adjacent to the Western Hemisphere due to successful attacks by Axis submarines. In this country these attacks have greatly curtailed coastwise tanker shipments, and import and export movements. The restrictions in water shipments from the Gulf Coast which started last month and which have become acute over the past 10 days, have brought reduced crude-oil purchases in fields, curtailments in many refinery operations and unfavorable market reactions.

Committees are now attempting to offset the reductions in coastwise transportation amounting to several hundred thousand barrels daily through the expansion of inland-transportation facilities connecting the fields and refineries of the Middle West and Southwest to eastern outlets. Reports the first of the week indicated that the solution of the problem would necessitate the pooling of all pipe lines including the operation of the domestic industry's 150,000 tank cars. The looping of existing pipe lines, new lines to connect major systems and additional combination pipe line-rail shipments are under consideration in the plans to bring about the maximum inland movement of petroleum. Many observers feel that these makeshift arrangements will not be sufficient to offset the loss in tanker movement so that some form of rationing will be necessary until permanent solutions can be made effective.

Particular attention is being given to means whereby the pipe-line movement of crude oil, north out of Texas and Louisiana fields, can be increased. Plans call for the final delivery of this crude through the major pipe-line systems to points in the Middle West where it will be transported east by pipe line or tank cars. Plans under consideration include the conversion of some natural-gas and product (gasoline) lines to crude-oil service.

DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 21, 1942	Feb. OPC recommended production	February state allowables	Feb. 14, 1942
Arkansas	73,330	74,500	74,500	74,085
California	654,750	632,300	632,300	662,250
Eastern fields	112,750	111,400	.....	111,300
Illinois	345,750	371,800	.....	339,140
Kansas	247,100	251,700	251,700	249,900
Louisiana	353,945	335,000	344,955	357,725
North Louisiana	*81,245*	.....	.....	*80,130*
Louisiana Gulf Coast	*272,700*	.....	.....	*277,595*
Michigan	50,700	47,000	47,000	52,600
Mississippi	90,480	57,400	.....	88,150
Nebraska	4,450	5,200	.....	4,400
New Mexico	120,370	119,300	119,300	119,920
Oklahoma	396,750	395,300	395,300	393,000
Rocky Mountain states	113,300	104,900	.....	115,940
Texas	1,513,800	1,596,000	1,606,389	1,502,650
East Texas	*368,400*	.....	.....	*368,150*
West Texas	*299,250*	.....	.....	*300,650*
North Central Texas	*148,700*	.....	.....	*145,650*
East Central Texas	*90,700*	.....	.....	*89,550*
Texas Panhandle	*86,700*	.....	.....	*82,750*
Texas Gulf Coast	*423,700*	.....	.....	*419,750*
Southwest Texas	*96,350*	.....	.....	*96,750*
Total United States	4,077,475	4,101,800	.....	4,071,060
Total production, Jan. 1-Feb. 21, 1942			214,853,795 bbl.	
Same period last year			184,367,840 bbl.	



Transportation Jam Forcing Drastic Oil-Traffic Action

By H. STANLEY NORMAN

UNSTOPPAGE of the transportation tangle that threatens to force a major relocation of pipe lines, tank cars and a far-reaching revision of production quotas received the full attention this week of oil men throughout the eastern part of the country.

Chief efforts in the immediate future will be devoted to increasing the tank-car movement of petroleum into the East Coast district. Already this movement hit a new peak of 256,725 bbl. daily, an increase of more than 33,000 bbl. over the preceding week which in itself established a new record for this type of transportation.

An emergency supply committee headed by T. E. Swigart, Shell Oil Co., Inc., was appointed Tuesday by H. C. Wiess, president of Humble Oil & Refining Co., and chairman of the District 2 transportation committee. This group was called into session at Houston, Tex., at 10 Wednesday morning and asked to stay in assembly until a report was evolved. Another committee headed by Harry Wood, Atlantic Refining Co., was called to meet in Washington, D. C., February 26 for a complete study of the coastwise tanker situation.

Specifically, the emergency supply group was asked to investigate all possibilities for increasing overland movement of petroleum from District 2 into the East Coast where the threat of shortage is most acute.

Idle Capacity Studied

Greater overland movement of petroleum from District 2 involves several possibilities starting with exploration of relief which may be achieved by using the full capacities of lines running oil north. Additional capacity may be utilized, it has been pointed out, by reversing certain lines. There is also the possibility that pipe-line capacity feeding the Gulf Coast in normal times, but not needed now with coastwise tankers diminished and circumscribed in their operations, may be relocated to implement greater overland movement north and east.

No practical consideration is accorded the suggestion that certain lines in Texas may be relocated to serve the East Coast directly, chiefly because it would require several systems of the size pipe available to do the same work as the 24-in. national-defense artery. Line relocation consideration, however, may logically be given to bridging certain gaps in existing systems and even to increase existing arteries by looping at strategic points.

The emergency—and oil men assert the present ramified transportation puzzle is acute not only for that state but for the entire country's petroleum economy—requires drastic and prompt action. There may be dislocations in producing operations even more extensive than already dictated by pipe-line rationing of purchases. Extensive changes in available transportation systems are certain to develop, possibly even to the point of using some of the interior gas lines for transportation of oil.

One suggestion that offers immediate possibilities of relieving the situation but not a permanent cure is to move 250,000 to 300,000 bbl. of oil daily from the Southwest to points in the Middle West that may be reached by pipe line and from there convey it into the East Coast district by tank car.

Such an approach to the problem would require sweeping changes in present systems but to overcome the 20 per cent deficiency in movement from the Gulf Coast to the eastern seaboard which normally totals 1,250,000 bbl. daily, calls for the drastic action that committees now studying the problem are expected to recommend.

The emergency committee working at Houston has been asked to have its report in the hands of Mr. Wiess in Washington by March 2 where it will be correlated with work of the tanker committee and discussed with the OPC and other government officials.

Rail Movement Increasing

Disclosure that railroads had moved a record average of 256,725 bbl. of petroleum daily into the East Coast district during the week ended February 14 was made at a press conference in Washington, D. C., February 19 by Harold L. Ickes, petroleum coordinator. At the same time, Coordinator Ickes disclosed that the Office of Petroleum Coordinator had instituted negotiations with tank-car operators in the Middle West that are expected to make more rolling stocks available for East Coast traffic. Deputy Coordinator Ralph K. Davies estimated the number of Middle West cars that may be available for East Coast movement at 5,000 to 10,000.

There were more than 14,000 tank cars engaged in the rail haul, back hauls and turn around lags during the week when movement averaged 256,725 bbl. daily. Efforts were unavailing to obtain a detailed appraisal of how much more oil could be moved by rail if the 5,000 to 10,000 additional cars are brought into service. The major changes in tank-car transportation that have enabled railroads to haul record volumes during recent weeks is an estimated increase of 25 per cent in the movement of cars. This, Coordinator Ickes, declared has been possible by cooperative action on the part both of the oil companies and railroads. Refiners have speeded up the loading and unloading of tank cars avoiding delays on both the supplying and consuming ends of the rail routes. Railroads are giving preferential treatment to movement of oil cars. Deputy Coordinator Davies said that the average oil car is now making a round trip between Texas loading docks and discharge points in the East Coast area in 11 days, elapsed time.

But this special effort by oil companies and railroads to relieve the East Coast supply situation was insufficient to offset the almost complete cessation of tanker movement from the Gulf Coast to North Atlantic ports. The exact status of coatswise tanker shipping is unavailable because of prohibitions against publication of this type of information which might provide aid and comfort for the enemy. Submarines continued their attacks on East Coast shipping and in the Caribbean, indicating that defenses are not yet adequate to cope with the menace to the extent that normal coastwise movement can be resumed.

Furthermore, the diversion of tankers to Pacific Coast service may have been extended by further gains of the Japanese in the Netherlands East Indies. Defenders in the East Indies continued their policy of yielding nothing but scorched earth. Relinquishment of Sumatra was accompanied by destruction of fields and refineries in the northern part of the island and in the vicinity of Palembang. Destruction of refineries in the vicinity of Palembang, the largest and most modern of all such facilities in the Netherlands East Indies, deprived the United Nations' air forces of their nearest and most accessible source of 100-octane gasoline. Both large refineries in the Palembang area, owned and operated by subsidiaries of Standard-Vacuum Oil Co. and the Royal Dutch-Shell group, contained facilities to produce 100-octane gasoline, totaling around 5,000 bbl. daily.

Meanwhile, East Coast petroleum stocks continued their decline which has been uninterrupted for the past 11 weeks. East Coast stocks totaled 82,034,000 bbl. on November 29, 1941, and declined to 59,627,000 bbl. on February 14, a reduction of 22,407,000 bbl., or 2,037,000 bbl. per week from the time tanker diversions and sinkings became a factor. Crude stocks increased on the East Coast 681,000 bbl., but this was more than offset by a decline of 2,660,000 bbl. in the inventory of refined products during the week ended February 4.

Voluntary Effectiveness Doubted

There is serious doubt among various executives of OPC that voluntary conservation of petroleum consumption as requested, particularly on the East Coast, will prove more than moderately successful. At least two other possible actions may relieve the East Coast situation to some degree. One is the possible reversal of the flow through certain pipe lines now engaged in transporting petroleum products out of the East Coast area into the eastern part of the Middle West. Another is the relocation of pipe lines in the southwestern section of the country as proposed last week by Jerry Sadler, member of the Texas Railroad Commission.

Indications in Washington are that the first concentrated effort of OPC to relieve the East Coast situation will be renewal of the application for steel with which to build the East Texas to New York 24-in. pipe line which, under amplification of its original design, would deliver up to 350,000 bbl. of oil daily. There is no indication of how promptly the WPB could reach a decision on allocation of steel for this project. In testimony before the Cole subcommittee earlier this month, Coordinator Ickes pointed out that the national defense pipe line would have been delivering oil into the Middle West and would have been well along on construction to the East Coast by now if steel had been made available last September. The coordinator was unwilling to criticize the old Supply Priorities Allocation Board, now incorporated in the War Production Board, for its final decision that the 456,000 tons of steel that would have been necessary for the pipe line was more

(Continued on Page 124)

JOURNAL SURVEY OF OPINION

OIL MEN VOICE THINKING ON CURRENT TOPICS

This is the first of a series of surveys the Journal's editors are conducting to ascertain how oil men are thinking about outstanding developments and proposals of current interest. Queries were addressed to a cross-section of managerial and technical personnel in the operating branches of the industry. Three questions were asked in this initial survey, and here presented is a compilation and analysis of more than 500 answers. The discussion is based on voluntary comment under "Remarks," as well as on direct answers.

Recoverable Reserves as a Factor in Allocation of Daily Production

1—Office of Petroleum Coordinator has proposed that future state allowables include "Recoverable Reserves" as a factor in allocating daily production. Do you consider such a proposal (a) ideal; (b) satisfactory; (c) bad; (d) ridiculous?

OF those who consider allocation of state oil allowables with recoverable reserves as a factor is "ideal," slightly over one-half qualified their statement. Many thought that markets, transportation facilities, and the saving of stripper production should automatically be included. Others felt that the method should not be carried to individual fields unless sufficient care was exercised to produce each field along sound engineering principles. Fear of politics and discrimination also existed.

Approximately one-third of those who think that inclusion of this factor is "satisfactory" also commented. In most cases, the comments were along the same lines as are outlined above, but there were some who questioned the advisability of moving too fast in making the plan effective, who were afraid that reserves might be considered to the exclusion of other factors or doubted whether they could be properly estimated. These fears were also expressed to a greater extent by the 55 per cent of those who thought the plan "bad" and who commented upon it. Many were particularly skeptical of the accuracy of reserve estimates.

Disorganization Feared

Other men who voted "bad" qualified their statements with the suggestion that this was not the time, that such a change would disorganize existing facilities to too great an extent. Whether these men would consider the plan "eventually" satisfactory cannot, of course, be stated. Some men applied the question to fields, as well as states, and it is also impossible to determine whether these men would have raised their opinion of the idea if allocation within state boundaries were specifically excluded from consideration of reserve estimates. Discrimination either on behalf of major companies or against certain states was also feared by some.

The feelings of the 55 per cent of those who think the idea "ridiculous" and who do not comment are more easily appraised than those of the ones who do comment. The impracticability of estimating reserves and the possibility of discrimination between states of class of operator again loom large. Others do not wish to disturb the existing system, although some qualify their statement by referring to "the present time."

The comments made by those who did not vote in some cases indicated that they thought the question indefinite which may be due to the indefiniteness of the OPC statement on the matter. It is possible that a clear-cut statement of the rate at which this factor will assume importance, the way in which it will be applied, and a rearrangement of the statement to place consideration of stripper wells first, then market demands and existing facilities and finally the recoverable reserves would have elicited a greater degree of unanimity among operators.

The amount of support which the idea has obtained is, however, considerable, being 56.1 per cent of all voting on the question, and it is significant that most operators do not seem to allow local considerations to sway their opinion on this matter. Most protest regarding the OPC plan for allocating state allowables has come from Oklahoma, yet of the answers received from Oklahomans, 42 per cent were favorable. All of the Michigan operators expressing an opinion, 56 per cent of the replies from Illinois, and 50 per cent of the replies from Louisiana were also favorable. California would not be likely to be affected by the plan yet 54 per cent were against it. As their state would benefit most from the plan, it is perhaps, understandable that 56 per cent of those thinking the plan "ideal" are Texans. However, 31 per cent of the Texans replying were opposed to the plan and 19 per cent of all who thought the idea "ridiculous" are from the Lone Star State.

THE QUESTIONS ASKED —AND THE ANSWERS

1—How do you regard the proposal to include "Recoverable Reserves" as a factor in allocating state allowables?

	Per cent
Ideal	9.0
Satisfactory	42.9
Bad	27.6
Ridiculous	13.0
No answer	7.5

2—How significant would be the savings through increased care and maintenance of equipment now in use?

	Per cent
Great	25.5
Moderate	45.4
Very little	27.8
No answer	1.3

3—Would construction of a crude and products pipe line starting in Texas to the Atlantic seaboard be in the public interest?

	Per cent
Yes	47.9
No	42.3
No answer	9.8

Saving Vital Materials by Better Equipment Care

2—Much has been said and written over the last few months on the saving of vital materials in oil fields by giving increased care and maintenance to existing equipment now in service. In your opinion, has oil-field equipment been abused in the past to such an extent that there does exist an opportunity for important savings during the present equipment shortage?

(a) Great opportunities for savings exist by more careful handling of oil-field equipment.

(b) Only moderate savings are possible through more careful handling of equipment.

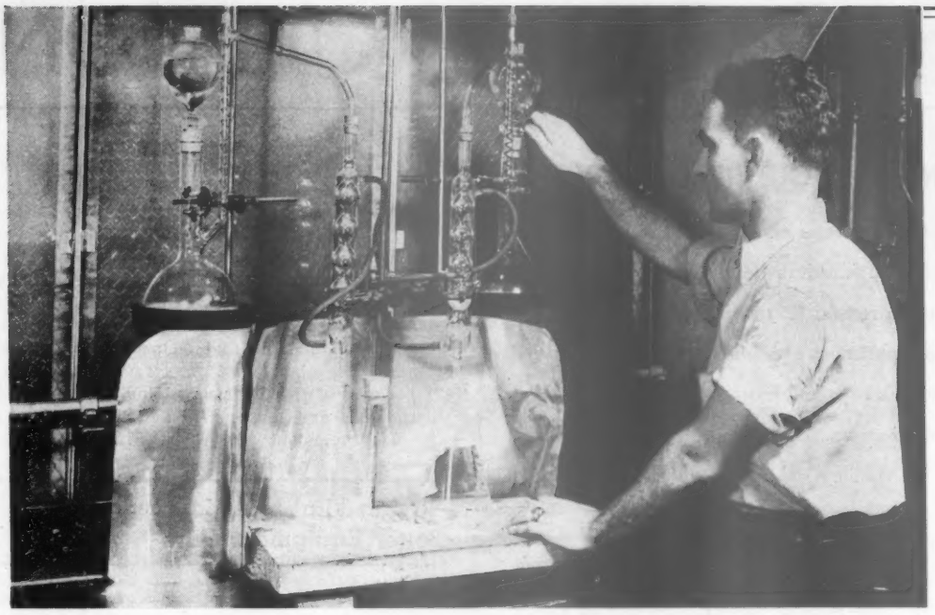
(c) Very little saving is possible, as the majority of operators have in the past handled their equipment in such manner as to obtain greatest economic usefulness.

APPROXIMATELY one-third of the replies falling in each group contained additional remarks and these followed a very similar pattern. The most general comment was to the effect that oil companies and independents had improved greatly during the past few years in looking after their equipment. There were numerous comments to the effect that oil-field equipment had to take hard knocks and that too careful handling would result in waste. A number in each class, however, referred to the need of educating workmen in proper handling of equipment and some mentioned the progress that had been made along that line, largely due to the cooperation of manufacturers. This is particularly true in the case of fittings, pipe, rope, packings, and valves.

Usable Equipment Discarded

Opposed to the responsibility placed on the workmen was criticism of executives for discarding equipment before obsolescence or while it still could be repaired, and one observer expressed the view that much equipment considered obsolete could be used to advantage by strippers. There was a tendency to consider that the majors took better care of their equipment than others although some blamed wealthy companies for most of the loss and one man stated that only the stripper-well operator knew how to handle equipment.

There was no significant geographic distribution in the three answers received except that no operators in Pennsylvania or West Virginia felt that great savings were possible. This may confirm the views that only strippers know how to care for equipment. The great majority of the questionnaires was sent to men who have the responsibility of handling or directing the use of equipment and nearly three-quarters of these consider that either moderate or great savings are possible. This suggests that if more executives had



THE $400,000,000 SYNTHETIC-RUBBER PROGRAM WITH THE PETROLEUM INDUSTRY EXPECTED TO SUPPLY A BIG MAJORITY OF THE RAW MATERIALS IS TAKING FORM. HERE A RUBBER CHEMIST IS PURIFYING ONE OF THE MINOR CHEMICALS THAT GO INTO PRODUCTION OF LATEX FROM BUTADIENE AND STYRENE.

This Week...

Amendment to P-98 abolishes necessity of obtaining countersignature of OPC district directors on orders for repair and maintenance materials amounting to less than $500.

●

Disclosure that East Texas bottom-hole pressure declined 15.85 lb. in January brought prompt action. The Railroad Commission issued its salt-water injection order, effective April 1, and OPC expressed alarm and called for action to halt the declining trend of pressure.

●

Texas' March production quota cut 85,400 bbl. daily as result of the sharp additions to storage, inability to move coastwise tankers at normal rates and lack of boats which have been diverted to Pacific and other military services. Oklahoma gained 10,000 bbl. in its next month's quota.

●

Offers to purchase large quantities of kerosene, distillate and residual fuel were made to all refiners in the Middle West by the East Coast's largest refiner and distributor. The company offered to supply tank cars if needed.

●

Tank-car movement of petroleum to the East Coast averaged 256,725 bbl. daily for the week ended February 14, an increase of 33,750 bbl. and the highest mark ever attained by rail.

●

Shelling of Bankline Oil Co.'s installations at Goleta, Calif., drove home necessity for protecting vulnerable properties, giving substance to pleas of the OPC and PIWC.

●

WPB issued orders prohibiting steel companies from shipping oil-country tubular goods carrying ratings inferior to A-9 after March 7 in the case of line pipe and March 14 in the case of tubing, casing and drill pipe. Reflects general tightening up for increased bomb production.

●

Ways of unstopping the transportation jam between southwestern producing states and the East Coast is receiving intensive study in Texas, Washington and other quarters.

●

Appropriation of about $32,000,000 has been approved for a synthetic-rubber plant on the Pacific Coast, the second such unit to reach this stage since announcement of the Government's goal of 400,000 tons by 1944.

●

Several more companies restricted purchases in West Texas and New Mexico fields when coastwise and overland transportation could no longer balance full allowables. Exempt are fields producing high-octane crudes needed to operate 100-octane gasoline plants.

●

WPB has issued Amendment 3 to M-68, telling the oil industry what is meant by "uniform spacing." Clarification of this point may stimulate drilling.

●

The District 5 OPC production committee is watching results this week of the California operations under an allowable schedule that provides a breakdown for every well and field in the state.

●

The decline in East Coast storage continues. A reduction of 2,660,000 bbl. in refined products' stocks for the week ended February 14 far outweighed a gain of 681,000 bbl. in crude along the seaboard.

●

Mid-Continent refinery gasoline prices yielded the first ground this week since rising to 6 cents per gallon in the middle of last year. Natural gasoline continues its skid.

●

Motor-fuel demand of 55,600,000 bbl. in March was forecast Tuesday by the Bureau of Mines, a figure 10 per cent greater than the actual a year ago.

been included, more emphasis might have been placed on "great savings." At any rate, nearly one-quarter of those who replied considered that great savings were still possible.

Texas-Atlantic Seaboard Pipe-Line Project

3—Do you believe the construction of a crude and products pipe line starting in Texas to the Atlantic seaboard, which would require 443,000 tons of steel, would be in the public interest?

NEARLY 10 per cent of those who replied to the questionnaire did not answer this question. Of those who answered "yes," 45 per cent commented. Most of them considered the question from a war angle. Some felt that other uses for steel might still take priority but many felt that the sinking of tankers along the Atlantic made construction of the line necessary. Five per cent of the replies were to the effect that continued use of the tankers would sink more steel than would go into the line. A number of replies stated that construction of the line would release tankers and railroad equipment for other uses and one operator pointed out that it would also release much of the Navy from convoy duty. A fair percentage, 11 per cent, said that the line should be built for peacetime as well as wartime use.

Practically the only qualification expressed by those who want the line built, outside of a possible steel shortage, was a fear of government control of the line or of industry through control of the line.

Of those who opposed building the line, 48 per cent commented on the proposal. Of these, 6 per cent thought that it was too late, 6 per cent thought that the use of gasoline in the East should be rationed, and 23 per cent felt that the steel could not be spared from war uses. Twenty-six per cent of the comments were to the effect that existing transportation facilities were adequate and of these less than one-quarter qualified their comment by the statement "if the tankers can be protected" and 30 per cent thought the railroads could look after the East. A number of the replies stated that the line would be uneconomic, otherwise it would have been built long ago, while 8 per cent feared government control or monopoly control.

Geographically, the replies to this question were of great interest, particularly those from Californians. California has little interest in this line as it would not compete in Pacific Coast markets and would not transport California crude. Nevertheless close contact with the war apparently affected their replies as 79 per cent of the Californians who expressed a view on the subject voted "yes." In fact, if the California vote were excluded, the remainder of the voters would be almost exactly evenly divided on the question. Of the Texans who expressed an opinion, 57 per cent were in favor of the line, while 58 per cent of the Oklahomans did not want it. Louisiana and Kansas were fifty-fifty on the proposition and the East was opposed to the line by a slender margin

Enemy Action Has Sunk Nine U.S. Tankers, Mostly Old

By J. P. O'DONNELL

NEW YORK, Feb. 24.—A summary of published tanker losses in waters adjacent to the United States shows that nine United States tankers have been reported lost and two damaged since Nazi and Nipponese submarines opened their full-scale attack on American shipping. Two tankers were lost in the Pacific and seven in the Atlantic. In addition a number belonging to other of the United Nations were sunk along the Atlantic Coast. The identified losses since December 7 are summarized in the accompanying table together with victims of the German attack on Aruba February 16.

It is interesting to note that all of the United States tankers reported lost were comparatively old vessels. Most of them were completed in the 1918-22 era when United States tanker building, under the impetus of the World War I program, reached an all-time high. The average age of the lost tankers is 21½ years. However, one of the damaged vessels, the E. H. Blum, completed in April 1941 by the Sun Shipbuilding & Drydock Co. for the Atlantic Refining Co., is one of the most modern and largest tankers. It had a capacity of more than 150,000 bbl.

Whether or not the list of United States tankers sunk by enemy action since the outbreak of war is complete is not known, but it is known that more foreign-flag tankers than those included in the table have been torpedoed in the western Atlantic since December 7. Crews of three unidentified Norwegian tankers have been landed at Canadian east-coast ports from ships reported sunk January 17, January 24 and February 12. Foreign tankers in the accompanying list are the Norness and Thalia, Panamanian registry; Coimbra, British; and Varanger, Norwegian. The four reported lost in the attack at Aruba were of foreign registry though owned by American oil companies. The Monagas was under the Venezuelan flag and the others were of British registry.

Loss of the United States tankers has not crippled coastwise transportation of oil as much as have protective measures taken to prevent further losses. Actually, if the ships shown in the accompanying table represent all United States losses, the size of our tanker fleet has grown since the start of the war. The losses are greater than the completions since the first of December, but the new vessels average around 9,700 gross tons each against 7,573 tons for those reported lost.

The larger size and faster speeds of the newer ships therefore would indicate a net gain in the transportation capacity of the fleet. A 50 per cent increase in capacity plus a 20 per cent increase in speed plus reduced turnaround time give a modern tanker about 80 per cent greater transportation capacity than old vessels. Tankers built in United States shipyards in 1939 and 1940, for example, had an average carrying capacity of 128,200 bbl. against an average of 85,000 bbl. for the ships lost, and speeds in the range of 12 to 16 knots against 10 to 10.5 knots for the others.

Tankers completed in January were 10,907-ton E. W. Sinclair, 7,874-ton Sinclair H-C, and 10,793-ton flagship Sinco, all of Sinclair Refining Co.; 9,920-ton Calusa of Socony-Vacuum, 8,071-ton Hulkoil of National Bulk Carriers and 11,641-ton John D. Gill of Atlantic Refining. Four 10,000-ton tankers were also launched in January.

According to a published report, protective measures have resulted in an increase of 2 days in the time required for a tanker to travel between Gulf Coast and North Atlantic ports. While this trip has been made in as little as 4½ days by high-speed tankers like the Ohio of the Texas Co., the average time is probably nearer to 7 days. If this is increased to an average of 9 days, the reduction in efficiency from the standpoint of time would be close to 30 per cent. A reduction of this magnitude would be of far greater consequence in transporting oil to the vast East Coast market than the loss of eight tankers.

The Monagas, Oranjstad, San Nicolas and Tia Juana reported lost, and the Pedernales and Rafaela, reported torpedoed but not sunk, in the attack on Aruba, were part of a fleet of approximately 75 small, shallow-draft tankers used to transport oil from Venezuela's Lake Maracaibo field to Aruba and Curacao refineries. Vessels of this type are required for this service because of the sand bar which blocks the entrance to Lake Maracaibo from the Caribbean and prevents the use of larger tankers. This fleet is owned about 50 per cent by Curacaosche Scheepvart Mattschappij (Shell) under Netherlands registry; about 33⅓ per cent by Lago Shipping Co., under British registry, and about 17 per cent by Mene Grande Oil Co., under Venezuelan registry.

Aruba is only about 20 miles off Peninsula de Paraguana, northernmost point of Venezuela, and Willemstad, Curacao's port, is only 60 miles from the Venezuelan port of Cumarebo. However, the tanker route from Lake Maracaibo, which is southwest of the Paraguana Peninsula and Cumarebo, through the Gulf of Venezuela is approximately 140 miles to San Nicolas, Aruba, and 160 miles to Willemstad.

The Texas Co.'s Arkansas was also damaged in the attack on Aruba and apparently badly damaged. It is a 6,452-ton vessel with a capacity of

The E. H. Blum, recently damaged by a torpedo, is one of the newest ships to be hit. It was launched last April

IDENTIFIED TANKER LOSSES DUE TO ATTACK BY ENEMY SUBMARINE

Name—	Owner	Capacity (bbl.)	Tons (gross)	Speed (knots)	Year built
Atlantic:					
Coimbra	Standard Trans., Ltd.	79,634	6,768	10.5	1937
Norness	Tankers Corp.	*120,000	9,577		
Varanger	Westfal-Larsen & Co.	125,389	9,305	11.0	1925
Allan Jackson	Standard Oil Co. of New Jersey	81,390	6,635	10.5	1921
Francis E. Powell	Atlantic Refining Co.	82,319	7,096	10.0	1922
Rochester	Socony-Vacuum Oil Co.	74,751	6,836	10.5	1920
W. L. Steed	Standard Oil Co. of New Jersey	76,010	6,183	10.5	1918
India Arrow	Socony-Vacuum Oil Co., Inc.	97,750	8,328	10.5	1921
China Arrow	Socony-Vacuum Oil Co., Inc.	97,750	8,403	10.5	1920
Pan-Massachusetts	National Bulk Carriers	105,000	7,573		1918
Pacific:					
Montebello	Union Oil Co.	75,000	8,272	10.0	1921
Emidio	General Petroleum Corp.	74,753	6,901	10.5	1921
Caribbean:					
Monagas	Mene Grande Oil Co.	30,562	2,650	9.5	1927
Oranjstad	Lago Shipping Co., Ltd.	21,920	2,396	10.5	1927
San Nicolas	Lago Shipping Co., Ltd.	21,930	2,391	10.5	1926
Tia Juana	Lago Shipping Co., Ltd.	21,920	2,395	10.0	1928
Thalia	Panama Transport Co.	102,270	8,329	10.5	1926

*Estimated.

75,033 bbl. and was built in 1919. Other United States vessels attacked but not sunk, according to reports, included the 8,207-ton Malay of Seminole Steamship Co., which was damaged but was able to reach port, and the Pan-Maine of Pan American Petroleum & Transport Co., which outmaneuvered a submarine and escaped undamaged. The Pan-Maine is a 7,237-ton vessel completed in 1936. It has a capacity of 100,800 bbl. and a speed of 12.5 knots.

In a later attack on Aruba on February 19 an unidentified Panamanian tanker was reported sunk, and the next day a United States flag tanker was reported torpedoed off Martinique. A British tanker was one of two ships hit by torpedoes but not sunk in Trinidad's Port of Spain Harbor February 18, and on February 20 the 13-knot 9,467-ton diesel tanker Kongsgaard, owned by Solvang of Norway, was torpedoed off Curacao and beached. The Kongsgaard was built in 1937 and had a capacity of 124,399 bbl. This increased the total of reported losses in the western Atlantic and Caribbean since December to 20 tankers. These losses plus the seven that were said to be damaged but not sunk and the escape of the Malay raised the total of known attacks on tankers to 28 in these waters.

Three tankers owned by United States oil companies were reported sunk before the war involved the United States directly. These were the 9,552-ton W. C. Teagle, with a capacity of 119,300 bbl., which was built in 1917 and reported sunk in October 1941, in the North Atlantic; the 8,902-ton Charles Pratt, with a capacity of 119,410 bbl., which was built in 1916 and reported sunk December 21, 1940, off West Africa, and the 7,053-ton I. C. White, with a capacity of 78,220 bbl., which was built in 1920 and reported sunk in the South Atlantic September 27, 1941. The first two were owned by Panama Transport Co. and the last by Socony-Vacuum Oil Co., Inc. These do not necessarily represent all the losses sustained by American oil companies and their subsidiaries for these companies have, or had, 200 or more tankers under foreign registry and it is highly improbable that their losses have not been greater than 1 or 2 per cent since some of these vessels were engaged in services directly or indirectly supplying oil to countries now allied as the United Nations.

Because of the losses and the consequent need

(Continued on Next Page)

Japs Gain Little Immediate Oil by Indies Conquest

NEW YORK, Feb. 24.—The immediate value of the conquest of Borneo and the invasion of Sumatra to the Japanese is believed to be small from an oil standpoint. Tankers have been reported taking on cargoes of Tarakan's peculiar crude oil. The quantity must be small since Tarakan's numerous wells are on the pump and the comparatively easy destruction of the surface equipment would require much work and material to restore production. Most of the wells are about 2,000 ft. deep and, under normal circumstances, could be drilled in 3 weeks. At least part of each of the main producing areas in the East Indies is located on low land where production is obtained at several hundred feet. Such wells would be easy to drill but equipment and drillers would have to be brought from Japan, 2,700 miles from Balik and 3,000 miles from Palembang.

During aerial attacks prior to the invasion of Sumatra, the invaders carefully avoided refining installations. It was apparent that they hoped to capture them intact and their hope was evident in the sudden attack by 700 parachute troops on the Shell refinery at Pladjoe. This strategy was successful in that it was made before the destruction was complete but Dutch troops are reported to have encircled the refinery and completed its destruction with mortars. The Standard-Vacuum refinery at Soengei Gerong was outside the immediate battle zone and its destruction was reported to have been accomplished without interference. The destruction of the oil properties was in the hands of the military and was not done by the oil companies, most of whose employes including, it is believed, all the Americans had previously been evacuated to Java.

In order to regain use of the refineries the Japs would not only need to restore the fields as well as the refineries but probably would also have to rebuild or repair pipe lines which transport the crude from the fields to the plants. These lines, like the 166-mile 8-in. line which carries Djambi crude from Tempino to Pladjoe, are laid through dense jungles and swamps. If they were systematically damaged, the lines would require considerable time to repair or replace. It took a year to build the Tempino-Pladjoe line, which was completed in 1935.

Loss of this area does not mean that the Western Hemisphere will be called upon to supply the markets whose requirements were formerly met by the islands. Fully 70 per cent of the Netherlands East Indies exports in the first half of last year went to areas now held by Japan, including the Gulf of Singapore islands used for storage and transshipment. Incidentally the Japs claim to have obtained substantial supplies of oil when they took the Gulf of Singapore islands, Bintan and Samboe, where large quantities of oil, particularly gasoline and crude oil, were in storage awaiting transshipment.

Destinations of Exports

The destinations of other East Indies exports in the first half of 1941 were: Western Hemisphere, 104,000 bbl., 0.5 per cent; Europe (United Kingdom and Balkan States), 235,000 bbl., 1.1 per cent; Burma, Ceylon and British India, 322,000 bbl., 1.5 per cent; China, 594,000 bbl., 2.9 per cent; Africa, 833,000 bbl., 4 per cent, and Australia, New Zealand, Timor, Polynesia and Micronesia, 4,060,000 bbl., 20 per cent. The only part of the market that might reasonably be expected to be supplied from the Western Hemisphere is the 22,400 bbl. daily going to yet unconquered Oceanic and some of this might just as well be supplied from Latin America as from the United States.

Australia and New Zealand are both dependent entirely on imports. Australia, which imported 18,000,000 bbl. in the last year for which complete date are available, got approximately 64 per cent from the East Indies, including a small amount from British Borneo. Another 20 per cent came from the Persian Gulf, about 12 per cent from the United States and the remainder from scattered sources. New Zealand likewise depended

Map of East Indies, showing oil production and refinery capacity over which the Japs have gained control

on the Netherlands East Indies and British Borneo for her oil supplies. The latest available report shows that 75 per cent came from the Indies, about 11.5 per cent from Bahrein Island and about 6.5 per cent from the United States.

China is in position to replace the Netherlands East Indies with Burma as a source of supply. This may be only a temporay expedient since Jap and Thai forces are nearing Rangoon, site of the 20,000-bbl. refinery of Burmah Oil Co., Ltd., the only refinery of consequence on the southeastern Asia mainland. This refinery processes crude brought from Burma fields farther north along the Irrawaddy River by pipe line. Invading forces which have crossed the Bilin River are only 75 airline miles from Rangoon and less than 50 miles from the railroad line supplying the Burma Road. This refinery is also of paramount importance in supplying British India and its loss would require some rearrangement of supply lines.

While the Far East Axis partner is improving its oil position, the European members are apparently continuing to experience serious but not critical shortages. Rumania is their principal supply of mineral oil and it is reported that production there has fallen to such an extent that some refineries have been forced to shut down. It is officially reported that exports to Germany last year averaged but 40,000 bbl. per day and at the same time that Italy, reached only by a circuitous rail route, got a mere trickle of less than 5,000 bbl. per day. The activities of these two in Africa are reported to be handicapped by lack of fuel but the long retreat across Libya and the subsequent recapture of much of the lost territory casts considerable doubt on this belief.

It is generally believed that Germany will launch another attack on Russia as soon as the weather relents and that this drive, instead of embracing the whole width of Russia from Leningrad to Rostov, will be concentrated in the south. It is expected to be directed at the oil-rich Caucasus. The present defensive operations of the Axis powers in the west are regarded as a breathing spell taken to replenish stocks of oil among other essentials and as a preliminary to another all-out attack that may win large resources but which may also exhaust limited supplies.

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Enemy Action Has Sunk Nine U.S. Tankers, Mostly Old

(Continued from Preceding Page)

for protective measures and the Japanese successes in the Far East, the task placed on the American tanker fleet has been tremendous. The loss of the East Indian field and refineries requires that oil for military operations in that area be supplied from the Western Hemisphere or the Persian Gulf. The size of this task is apparent from a glance at the distances between Sydney, Australia's main port, and probable sources of supply. Sydney is 7,364 miles from Abadan, site of Anglo-Iranian's great refinery at the top of the Gulf of Persia; 6,744 miles from San Francisco; 6,750 miles from Talara, Peru, where International Petroleum has a comparatively small refinery, and 8,300 to 8,400 miles from Aruba and Curacao.

However, Japan's task in supplying her forces in the Southwest Pacific is attended with some difficulty. Balik Papan is 2,700 miles and Palembang is 3,000 miles from Yokohama by tanker, and if the demolition of the Indies refineries was complete Japan must supply her forces with oil processed at refineries in Japan proper. Her prewar fleet of 49 tankers, many of which are high-speed vessels with at least 25 per cent of them in the 14½-19-knot class, should be able to do this though with seven tankers sunk and two damaged, the United Nations have already accounted for 20 per cent of the Nipponese tanker fleet.

One of the most encouraging factors in the tanker picture at the moment is that United States construction has managed to more than offset losses despite the fact that it has not yet reached its full wartime production rate. Vessels completed in January included only private-company contracts and none of the Maritime Commission boats have yet gone down the ways. When the commission's program reaches the construction stage, tanker construction in this country will be the greatest in the history of the world. Admiral Land, head of the Maritime Commission, told the House appropriations committee that the present shipbuilding program calls for the construction of 261 tankers and that it would give the United States "the best and biggest tanker fleet in the world at the end of 1943."

J. Howard Pew, president of the Sun Oil Co., said at the company's annual meeting that its wholly owned subsidiary, Sun Shipbuilding & Dry Dock Co., had uncompleted orders for 129 ships (95 per cent tankers) at the year end and that "by the beginning of 1942 production had been so far speeded up that our schedule now calls for the delivery of an average of one ship every week during the year."

Incidentally, Admiral Land also told the committee that he was convinced that commanders of Nazi submarines have orders to "sink a tanker" if they have a choice between two vessels. He explained that since more tankers than cargo ships operate in coastal waters more tankers are being torpedoed. "The coastal operation is as well known to Germany as it is to us, around Venezuela to the north. They know that just as well as we do."

Admiral Land's statement of the prospective dominance of the United States tanker fleet is substantiated by the evidence. Consideration of war losses to date, construction under way and the fact that American oil company subsidiaries have approximately 200 tankers operating under foreign flags, indicates that this country will either control or influence the control of close to half of all the world's tankers.

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Program for Conserving Fuel Oil Started in the East

NEW YORK, Feb. 24.—Plans for distributing available supplies of all grades of fuel oil from No. 1 to No. 6 and including kerosene, range oil, gas oils and diesel oil, have been released by the District 1 subcommittee of supplies and distribution following their approval by federal authorities. Briefly, the plans are designed to prevent accumulation of excess stocks and, in doing so, to save an estimated 3,000,000 bbl. between now and April 1 that is expected to go far to relieve the current East Coast shortage.

"Because of the shortage of transportation facilities now available to District 1, the supplies of fuel oil in this area are below a normal and safe level, the committee report states. "Although every effort is being made to increase the quantity of fuel oil being transported into District 1, the available supply of this product is in a critical position and it is essential, in the national interest, that steps be taken immediately to avert or alleviate this serious shortage. . . .

"The period of greatest demand for fuel oil during the current season will be for the next 7 to 8 weeks. It is believed that consumers and resellers have in storage a greater amount of fuel oil than is necessary to meet their normal requirements. In order to provide distribution of the available supply of fuel oil in District 1 to meet the needs of (1) the military forces of the United States; (2) the war needs; 3) the essential civilian requirements, and (4) other reasonable civilian requirements, all marketers of fuel oil in District 1 shall comply with the plan."

In summary the plan provides that:

1. No delivery shall be made to a consumer of fuel oil for other than domestic heating if his stock is in excess of a normal 14 days' supply. If the stock is only equal to or less than 14 days' supply, an additional amount not exceeding the capacity of a single delivery unit (tank car, tank truck, barge, etc.) or an approximate 2 weeks' supply, whichever is smaller, may be delivered.

2. If the stock of a consumer of fuel oil for domestic-heating purposes is greater than 20 per cent of his tank's capacity, no deliveries may be made to him. If the consumer's stock drops below 20 per cent of his tank's capacity, an amount that will bring it up to not more than 75 per cent of capacity may be delivered to him.

3. Deliveries may not be made to a reseller if his stock is greater than he would normally use in 14 days. If his stock is only equal to 14 days' supply or less, the same provisions apply to him as to users of fuel oil for other than domestic purposes.

These restrictions will not be applicable to sales and deliveries of fuel oil (1) to hospitals or buildings used for hospitalization, (2) to domestic consumers whose tanks are of less than 200 gal. capacity, (3) to resellers or consumers at water-terminal locations that may become isolated due to freezing of the water route, and (4) to points where delivery has heretofore been made and is normally made in ocean-going tankers.

Farish Requests Quotations on Tank-Car Shipments to East

NEW YORK, Feb. 24.—Requests for quotations on kerosene, heating oils, Bunker C and No. 6 fuel oils to be shipped by tank car to relieve the "desperate need" existing on the East Coast, have been wired by W. S. Farish, president of the Standard Oil Co. of New Jersey, to all refiners in the Middle West and southwestern states, including Texas, Oklahoma, Kansas and Nebraska.

Quotations were asked both for loaded tank cars to be delivered in 30 to 60 days, and for material for shipment in cars to be furnished by the Standard Oil Co. of New Jersey. The latter company offered to furnish cars so far as possible if other cars were not available to the refiners.

Mr. Farish stated that an effort was being made to avoid rationing of these products which is threatened on the East Coast for the near future, and that from these refiners he hoped to obtain adequate stocks.

Illinois Production Depends on High Discovery Rate

By W. V. HOWARD

ILLINOIS' production lying between the northern Mid-Continent field and the principal markets of the East has furnished many headaches to conservation officials and also to oil-transportation companies. Enjoying a differential of about 23 cents in transportation costs with a price for crude at or little above Mid-Continent levels, this oil has been in great demand. Having no state conservation laws, operators have been privileged to drill their properties as rapidly as possible and to produce them to capacity and have felt themselves justified by the laws of supply and demand. The oil was needed, Illinois could provide it, and the protests of other states were considered selfish. They had had their day anyway and Illinois had paid tribute to Oklahoma long enough. At least that was the claim of many Illinoisians.

After a drilling boom which has lasted for 5 years, Illinois has confounded many critics who claimed that the state was encouraging rapid depletion of its resources. During this period 118 new fields have been opened up in the state and production from these fields rose to a high of just under 15,000,000 bbl. in July 1940 only to decline nearly one-third by the end of the year. In 1941 a flock of discoveries brought production up again to over 12,000,000 bbl. but the rise was short-lived and production is again nearing the 10,000,000-blb. mark.

Of the 118 fields discovered, not including those which have since been merged into consolidated fields, 57, or nearly half, have fewer than 10 producing wells and have not added much oil to the flood. In fact, until the end of 1940, 80 per cent of the oil came from 11 major fields. It is interesting to trace the history of these fields.

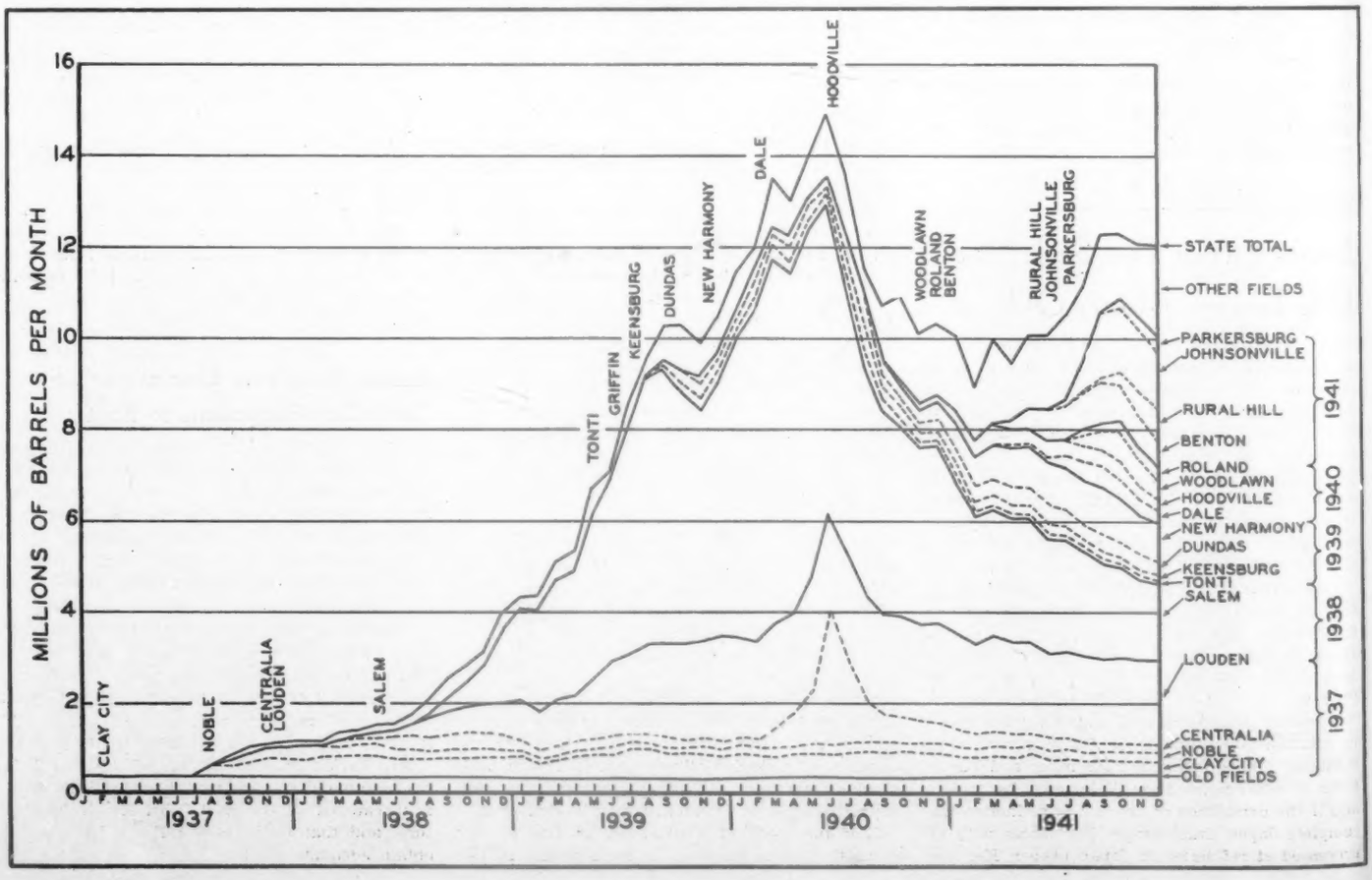
Illinois Production Record

The accompanying diagram shows the production record of Illinois by months with the production from major fields segregated. The first discovery of major importance, Clay City, did not add appreciably to the state's output for several months, and almost immediately afterward Noble became an important producer. Centralia and Louden were also discovered in 1937 but did not become important factors during the year. At the end of the year, the old fields produced about 30 per cent of Illinois' oil, scattered new fields 10 per cent and the McClosky area the remainder. Today the same fields produce only slightly less. Centralia did not prove its potentialities until the middle of 1940 when, with Louden and the other 1937 discoveries, production from these fields rose to 5,700,000 bbl. The old fields, together with those discovered during 1937, are now producing at the rate of 3,000,000 bbl. a month, or 25 per cent of the state's December production, and further decline will probably be slow as Louden now occupies the leading position among the state's producers and is well under control.

The only major producer found during 1938 was Salem, which was about all that the disturbed market conditions of the next 2 years could stand. Almost immediately Salem became a major factor in Illinois production and at its peak topped the 6,000,000-bbl.-a-month mark and accounted for nearly half of the state's production. From this it has declined swiftly to less than one-third of its peak.

The discoveries of 1939 followed the same pattern as 1937 in that it was several months before they became important factors. Tonti, Griffin and Keensburg (subsequently joined) and Dundas together accounted for about 6 per cent of Illinois' production by the end of the year and have not declined greatly, owing to a steady development

Illinois production, 1937-1941, showing discovery date and production of major fields



campaign. The last 1939 discovery, New Harmony was an even slower starter and is still within 25 per cent of its peak of 1,000,000 bbl. a month. The major fields found in 1939 are now producing about one-tenth of the state's oil.

With the exception of Hoodville, none of the 1940 discoveries was highly regarded until well into 1941. Of these, Woodlawn was only producing about 70 bbl. a day in June but soared to 22,000 bbl. in October. The 1940 major discoveries are now producing about 10 per cent of the total for Illinois.

Four major discoveries made in 1940, Benton, Rural Hill, Johnsonville and Parkersburg duplicated on a small scale the record of Salem. Benton rose from under 10,000 bbl. in January to over 800,000 bbl. in August and has since lost about 25 per cent. Rural Hill started in July and in December produced nearly 625,000 bbl.; Johnsonville also started in July and in November hit a peak of 1,450,000 bbl. Parkersburg, coming in a month later, was just under the 300,000-bbl. level in December. These four fields were responsible for about 25 per cent of Illinois output at the end of 1941.

During the next year the 1937 and 1939 discoveries will probably continue with a slow decline, but Salem and the majority of the past 2 years' discoveries appear likely to decline rapidly. New fields found in 1942 may reverse the present downward trend in production, but it appears that this will be carried to 7,500,000 bbl. a month before there will be sufficient development to reverse it.

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OPC Lists Seven Oil Industry Projects in War Program

WASHINGTON, D. C., Feb. 23.—A prediction that war demands may require production of oil in the United States at the rate of 1,500,000,000 bbl. a year was made today by Secretary of the Interior Harold L. Ickes in announcing a list of 52 projects which various units of the Interior Department propose to conduct to aid the war effort.

Most of the seven projects listed for the oil industry are already under way by the Office of Petroleum Coordinator. Doubling the production of helium is one of the projects, and others range from developing new methods of working low-grade mineral ores to discovering new sources of seafood. The program was developed by the War Resources Council of the department. Excerpts relating to oil and helium follow:

The department proposes:

1. To organize petroleum production based upon sound engineering techniques so that operating wells and fields can produce at sustained rates without injury to our remaining reserves and so that the crude oils, condensates from high-pressure fields, and natural gasolines needed for aviation gasoline and lubricants, toluene, synthetic rubber, and other specialized products will be available in the quantities required when needed; to stimulate exploration for new reserves, and, through cooperation with state regulatory bodies, to leave in safe underground storage those crude oils not immediately important to the war effort. (Office of the Petroleum Coordinator.)

2. To multiply the industry's capacity to manufacture high-octane gasoline for war planes to as much as 200,000 bbl. per day; to stimulate the financing and erection of 100-octane plants; to control closely the aviation-gasoline supply to insure its appropriate use; to organize the natural-gas and natural-gasoline industries to meet plant fuel requirements and to obtain the maximum production of the components of aviation gasoline, as well as rubber and other synthetic products, and to stimulate the production of aviation lubricants. (Office of the Petroleum Coordinator.)

3. To establish new and more effective transportation methods required in moving blending stocks for aviation gasoline; to reshape the complex transportation system of the oil industry by substituting tank cars, trucks, and pipe lines for tankers diverted to war service. (Office of the Petroleum Coordinator.)

4. To formulate and, if needed, to direct marketing programs to insure the best distribution of available supplies for civilian uses in the event of the disruption of normal deliveries; to coordinate marketing and distributing facilities so as to maintain inventories, and to find and obtain petroleum products for use by the armed forces, essential industries, and civilian activities if normal channels of procurement do not bring about the necessary results. (Office of the Petroleum Coordinator.)

5. To formulate plans for the manufacture of essential components of synthetic rubber from petroleum products, including butadiene and styrene; and to stimulate expansion of plant capacity for the manufacture from petroleum of toluene for explosives. (Office of the Petroleum Coordinator.)

6. To engage in an active geological exploration campaign with the view of determining all possible areas in which prospective drilling for new deposits of petroleum and natural gas may be successful. To promote and encourage exploratory operations on lands owned or controlled by the United States having potential value for petroleum products; to take steps to insure adequate and proper development of known reserves on such lands, and to cooperate with industry and state authorities in attaining these objectives where such lands are interspersed with lands not under exclusive federal control. (Geological Survey.)

7. To make available to the petroleum industry the latest developments in technical methods, practices, and procedures in the production, handling, transportation, and storage of petroleum and its products; to make available fullest technical guidance in the protection of petroleum in storage against deterioration, contamination, fire, or sabotage and other hazards; to keep the industry fully advised as to the trends of demands and requirements in order that it can gage its necessary operations in advance so that the supply of products may be continuously available where, when, and as needed. To conduct all of these activities in such a manner as to bring all units of the petroleum industry, large and small, into the war program; and to execute that program so that no unnecessary dislocation of competitive positions in the industry, or hardship to the general public, shall occur. (Office of the Petroleum Coordinator, Geological Survey, Bureau of Mines, Petroleum Conservation Division.)

Helium for War

Helium is a light, noninflammable war gas of which the U. S. Government has a world monopoly. To supply the increased demand for helium that has arisen from the war the department is drilling four additional wells in the government-owned fields which supply the government helium plant; it is increasing the capacity of that plant 50 per cent by installing an additional production unit, and it is preparing to construct an additional plant. Effective measures which in the past have prevented any of this helium from reaching the enemy will be continued.

The department proposes:

1. To double in 1942 the record production of the 1941 fiscal year. (Bureau of Mines.)

2. To make a comprehensive survey of gas fields suitable for helium production, in order to select sites for additional helium plants. (Bureau of Mines, Geological Survey.)

3. To continue research to reduce costs of production of helium. (Bureau of Mines.)

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Scrap-Collection Drive Is Begun

WITH Scrap Collection Week for the Texas petroleum industry at the halfway mark, hundreds of tons of scrap were already piled up this week in collection centers in 100 Texas counties.

"The response of Texas oil and gas operators and supply men has been even better than we expected," said Charles F. Roeser, general chairman of the drive sponsored by the Texas Mid-Continent Oil & Gas Association.

"Many of the operators had never attempted to move any of their scrap before, and the quantities found have been surprising. One North Texas operator collected 40 tons of scrap iron and steel on his leases alone. Many smaller operators are finding 2 or 3 tons, while in cases where less than a truckload is on a lease, the operator is pooling his load with an offset owner."

Collection week, which ends Saturday, is only the beginning of the Texas oil and gas industry's collection campaign, Mr. Roeser made clear.

"This week is only the kickoff," the chairman explained. "We're in the game until it is won.

"By having collection week, however, we are able to get in a large amount of scrap in a hurry, and get it started moving to the mills now needing it. We will also have part of our campaign out of the way before the state-wide general collection drive starts, which will help prevent crowding of scrap dealers and railroads, and also allow oil men to devote some time later to the general collection in their own areas.

Two general plans of collection are being used. In some cases, operators are having scrap dealers come on their leases and buy the scrap there and truck it out. In others, the operators themselves are trucking it into the collection centers, either to trackside collection lots or to scrap dealers' yards there.

"Either plan is acceptable, at the option of the local chairman and committee," Mr. Roeser said. "What we want is the most practicable method in each particular area, and that depends upon local conditions. The main job is to:

"1. See that the scrap iron, steel, aluminum, other metals and rubber are collected and moved to collection lots or scrap dealers' yards.

"2. See that it is shipped to mills needing it.

"3. See that mills making oil-field goods have a chance to buy it from your scrap dealers."

STATE CAPITALS...

TEXAS

NEW WARTIME REGULATIONS governing the salt-water-injection program in the East Texas field were issued last week by the Texas Railroad Commission, just a few days after it had been revealed at the state-wide proration hearing that pressure in the field had dropped at the alarming rate of 15 lb. during the month of January. The new order, effective April 1, will enable the East Texas Salt Water Disposal Corp. to begin large-scale injection work since it removes the principal objections to the previous order.

It allows operators who earn bonus oil (at the rate of 1 bbl. for every 50 bbl. of water injected) to transfer that portion of their allowable to a lease in another part of the field. The previous order allowed the bonus oil, but provided that it must be taken from the injection lease, usually an edge property incapable of taking advantage of the increase.

Another provision of the new order will allow operators with wells making more than 100 bbl. of water daily to shut down those wells and produce the allowable from the same lease. The regulation also stipulates that bonus oil cannot be produced from the wells which are making more than 25 per cent salt water.

Commissioners Jerry Sadler and Olin Culberson issued a joint statement in which they said they signed the order reluctantly and did so only because of war demands and "of the importance in the picture of national defense which this huge oil reservoir occupies." They also emphasized that the order would be effective only for the duration of the emergency. Mr. Sadler conferred for 2 days in Washington with Petroleum Coordinator Harold L. Ickes before the order was issued.

Objections to the order, according to the statement, were that the two commissioners believed it is illegal to allow the transfer of bonus oil to wells which will, as a result, have a larger allowable than those on adjoining leases. They also said the provisions would result in a tremendous amount of detail accounting and policing.

On the other hand, evidence at hearings had indicated, they declared, that it was necessary to return all water to the sands in order to produce some 600 million barrels of oil which would not otherwise be recovered. And, since the pressure drop was attributed to the large volumes of water now being produced in East Texas, it was believed the injection program under the new order would stop any serious decline in reservoir pressure and thus prolong the life of the field many years.

IMMEDIATE ACTION to remedy the "alarming rate" of pressure decline in East Texas was recommended last week by the Office of Petroleum Coordinator in Washington after Coordinator Ickes had conferred with members of the Texas Railroad Commission.

"I am greatly concerned for the future of the East Texas field," Coordinator Ickes said.

"It is the number one source of oil in the United States, containing 10 per cent of the national reserves of crude petroleum. So important is it, in fact, that it may well be considered as our factor of safety in supplying the nation's petroleum requirements for the duration of the war.

"Yet the future of this vital field is being seriously menaced by the increased production of salt water, as a result of which the reservoir pressure declined dangerously in January. This and previous drops have brought the pressure down so low that it is close to the point of being insufficient to maintain the natural flow of wells.

"There is imperative need for immediate action to remedy a condition, which, if it is allowed to continue, cannot but result in permanent injury to us in our ability to supply the needs of our armed forces and war industries for petroleum.

"I commend this problem to the attention of the Texas Railroad Commission," the coordinator concluded.

ILLINOIS

RULES AND REGULATIONS governing secondary recovery of oil by water-flooding methods in Illinois have been released by the Oil and Gas Division of the state Department of Mines and Minerals, after operators announced a plan to reopen the Westfield pool and adjacent territory in Clark County.

Operators must file application for 10 days in the division's office in Springfield, and publication must follow in a newspaper of general circulation in the county where the water flood is located, according to G. C. Curtis, superintendent.

Owners or operators of water-flooding projects must keep records of the volume of water injected into the oil-bearing strata; the amount of oil produced therefrom; pressure maintained on water-intake wells to flow oil; and pressure maintained on water-intake wells to pump oil.

MONTANA BOARD CHAIRMAN . . .

A. B. COBB, Cut Bank producer and head of Home Oil & Refining Co., Great Falls, Mont., has been elected chairman of the Oil Conservation Board of Montana. The election came at the first meeting of the newly appointed board chosen by Gov. Sam C. Ford. L. J. Yealey, Shelby producer, was named vice chairman, and R. P. Jackson, of Great Falls, was reelected secretary

CALIFORNIA

THE PETROLEUM COORDINATOR having approved the method of allocation used in fixing California's field and well allowables for the month of February, the production committee for District 5 is now able to finish all computations and mail out allocation schedules to each producer. The method of allocation was approved February 20 and all schedules were expected to be in producers hands by February 24. This means that the committee will start off with a clean slate as of February 20 and that all overproduction or underproduction during the first 19 days of February does not count in making comparisons with the amount set by the petroleum coordinator late in January. By using only the last 8 days in February as coming under the allotment, the production committee can now go ahead with plans for March allowables so that when the total state allowable is set by the petroleum coordinator the committee will have the ground work completed. This will eliminate the long delay each month in setting the well allowables after the program has been approved. In computing the allowable for the last 8 days in February, the committee took into account the demand for the various grades of crude-oil, natural-gasoline and natural-gas consumption, disrupted transportation facilities and other important factors.

ALLOCATION SCHEDULES prepared by the Production Committee for District 5 were approved Monday by the Office of Petroleum Coordinator. The schedules cover the period from February 20 to 28, and they authorize that California should produce 632,300 bbl. per day in February.

The schedules, proposed to the coordinator's office by the district production committee, are based upon methods developed by the California Conservation Committee, the Allocation Committee, and the Engineering Committee, all of which are subcommittees of the district production committee. The committees have been working on the problem since the adoption of the fundamental program by the Office of Petroleum Coordinator December 11, 1941.

Consideration is given to maximum efficient rates of production, minimum rates, stripper-well problems, gravity and kind of oil, as well as requirements for natural gas, out of which is recovered isobutane, used in the manufacture of aviation gasoline, and to oil transportation dislocations caused by the war.

A similar schedule for the month of March is expected to be submitted for approval shortly.

KENTUCKY

A RESOLUTION authorizing the State of Kentucky to join the Interstate Oil Compact has been passed by both houses of the state legislature, and now awaits only its signing by Governor Johnson to become effective.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Transportation—the Immediate Problem

As the war progresses, it becomes increasingly apparent that many of the petroleum industry's principal problems for a long period will center around its transportation operations. Right now curtailment in normal shipping presents perplexing difficulties to which immediate solutions must be found.

It is not generally realized that approximately two out of three barrels of the world's oil, either as crude oil or refinery products, are transported by water from several hundred to several thousand miles before they are consumed. Petroleum is found in a few scattered land areas, and the high seas in all parts of the world are used in its distribution to 1½ billion consumers.

At this time, with major victories to its credit in the Far East, the Axis has sufficient power to make itself felt in practically all of the tanker lanes. There are no ocean waters at this time to which the 1,700 tankers of the United Nations can go without danger of attack.

While the recently reported sinkings in this part of the world have been little more than equal to new tanker construction, the success of the enemy has made protective measures necessary. Convoy shipments mean a 25 to 50 per cent reduction in tanker deliveries.

The situation with which this country is now confronted springs largely from German submarine activities, first along the Atlantic seaboard, and now in the Caribbean waters. The Japanese present a similar threat to the West Coast.

Normally through the Gulf of Mexico and the Caribbean Sea more than 2 million barrels of petroleum move daily. This includes the 1,400,000 bbl. coastwise and export shipments from the Gulf Coast in this country and the 675,000-bbl. exports from Venezuela which are closely associated with the operation of two of the world's largest refineries in the West Indies. Smaller shipments from Colombia, Trinidad, Mexico and tanker transportation through the Panama Canal complete the total.

This water movement accounts for the petroleum supplies of tens of millions of consumers in this hemisphere and practically all of the present consumption of the British Isles. Other markets of the Eastern Hemisphere, many of them of military importance, look to this transportation center for all or part of their oil.

In this country approximately 1,750,000 bbl. daily of domestic and foreign supplies normally are transported by ocean tankers from terminals and plants to points of distribution. This figure does not include the essential military and civilian requirements of Canada which are more than 50 per cent dependent on water transportation. Until the enemy boats are driven out of the Atlantic and the eastern Pacific it is certain that all tanker operations will be substantially curtailed.

Because shipments by water are the most economical method of transporting oil, this nation's pipe-line system was not designed to supply the eastern part of the country with all of its oil. Large increases in deliveries are only possible through the construction of new lines. Tank cars are doing an outstanding job, and their use will be further expanded but they cannot offset in full the reduction in tanker transportation.

An emergency situation, more serious than the tanker shortage of last summer and fall, is here. It is not a problem confined to one area nor is its solution only the concern of a few companies whose operations include the consuming areas directly affected. The inevitable reactions are already apparent in the operations of many fields and plants and will spread to others.

Those familiar with conditions, cooperating with Washington officials, are endeavoring to work out solutions with a minimum of inconvenience and sacrifice to the industry and consumers. They are entitled to and will have the full cooperation of operators everywhere.

VIEWS for VICTORY

Industry's Duty to Be Tolerant And Helpful to Federal Agencies

By MURRAY C. SELLS
President, Sells Petroleum, Inc.

EVEN with our patriotism bristling at 100 per cent plus, you often hear men question the practical knowledge of high governmental control, or perhaps we should say, directing agencies. These remarks are almost wholly made in a constructive spirit, hence, are justifiable. For a host of most able men have made this their life work, and of course, they are in all of the varied branches of the industry, and too, this takes into account the supertrained scientific and technical men. Would I exaggerate to say a few men composing these agencies could not start to acquire and possess this vast store of not always fact, but practical and technical information?

I would say it is our duty to be tolerant and helpful to the utmost to these agencies. The big men that they are, we should grant that they are well aware of their inadequacy in some matters.

I am sure the personnel of these agencies would doff their hats in respect to hundreds of men for their superior knowledge in varied branches of the oil industry. They are not claiming, and should not claim that they are superior or equal to the knowing oil giants.

Surely it is their sincere aim to marshal these practical and technical elements for advice and cooperation, resulting in proper directing and administration. Without their coordination, we would be comparable to a large business corporation without an able and efficient manager.

Oil Shortage Possible Unless Drilling Program Spurred

By R. OLSEN
President, R. Olsen Oil Co.

FOR several months our leading newspapers and trade journals have devoted much space to the possibility that 30,000 wells must be drilled in 1942, supposedly forced on the industry as an unusual measure to keep pace with the increasing demand for oil. It is, therefore, extremely interesting to observe that 31,341 wells were drilled in 1941 and that it was necessary to draw on oil in storage to maintain the approximate average of 4 million barrels per day for the last 3 months of the year. This, of course, is nothing but an indirect admission that our present fields as developed to date are not capable of producing enough oil to take care of the present requirements.

It is now estimated that it will require at least an average of 5 million barrels of oil per day to supply the demand for 1942. As soon as we begin to draw on our present reserves to this extent, we might as well face the inescapable fact that far more than 30,000 wells must be drilled to maintain the estimated daily average consumption, to say nothing about building any reserves for increased demands yet to come. This statement, of course, is based on the assumption that new discoveries will at least equal those of last year.

It is physically impossible to meet this approaching emergency at this time with the industry burdened with present restrictions and shortage of materials and equipment, and it is quite obvious that, unless something is done to relieve the situation, before very long we will suddenly wake up to the realization that there is an acute shortage of oil, which can only be made available through the drilling of an adequate number of wells.

Premature Abandonment of Small Wells Must Be Prevented

By H. B. FELL
President, Simpson-Fell Oil Co., Vice President, I.P.A.A.

WE are at war. The war must be won. This will require sacrifices by all. Selfish individualism has no place in our program. A joint effort by government and industry in developing and carrying out a program for the petroleum industry during the war period seems proper. No doubt there will be some inequities and mistakes but these can and should always be corrected if the cooperative effort of governmental agencies and industry representatives functions efficiently and fairly.

Limited supplies require the development of proven oil fields and the discovery of new reserves with much less equipment than is normally available. Fundamental principles, upon which the distribution of equipment available on an equitable basis will result, must be adopted. Orders M-68 and P-98 are a move in that direction. A few additional revisions must be made in M-68 to permit securing of supplies immediately to keep producing wells in operation and prevent shutdowns that might cause irreparable damage to some wells. Some exceptions will be necessary to basic rules but care must be taken to prevent discrimination. Applications for exceptions may be so numerous as to impose a serious burden on a centralized agency. The decentralization of applying these orders through state agencies to the greatest extent possible would expedite action.

Oil producers are having difficulty in meeting their obligations to the war program on account of the low price of oil. It has been at depressed levels for years. These low prices, together with substantial increases in costs of production and discovery, have resulted in the acceleration of premature abandonments of small wells and a decrease in discoveries. This serious situation should receive immediate consideration and action by proper governmental agencies.

Search for New Reserves Is Predicated on Fair Prices

By R. H. COLLEY
President, Atlantic Refining Co.

WAR purposes alone may require the petroleum industry to supply as vast a volume of products as our entire country used for all purposes in the war year 1917. Furthermore, the destruction of oil fields in the Eastern Hemisphere may require the American industry, with the help of the rest of the Western Hemisphere, to supply most of the petroleum requirements of friendly neutral nations for an indefinite time. In recent years the United States petroleum industry has demonstrated its ability to carry the brunt of this task. It has produced 63 per cent of the world's crude oil from only 6 per cent of the world's land area. If extended, it could, single handedly, supply all neutral and allied countries with their maximum military and indispensable civilian requirements.

During 1942, at least 1,500 million barrels of crude oil, a new all-time peak, will have to be produced and processed in the United States. Barring unpredictable, insurmountable obstacles, the petroleum industry will fill all demands. It has approximately the largest known underground reserves in its history; it has tapped them with 380,000 wells; and it has put into practice the latest techniques for maximum recovery of the oil and for conservation of the natural forces which makes recovery economical. This is true conservation.

To maintain reserves enough ahead of demand to produce crude oil economically, searches must be carried on in unknown, often remote, areas. The search for oil is costly. It is predicated on the prospect of compensatory prices for the oil when it is found. Just now the prices for petroleum products do not offer incentive for an expansion of efforts to discover and develop crude-oil reserves suited to the needs of today. A comparison of the profits which present petroleum prices yield with the profits of other businesses indicates a lag in the movement of petroleum prices. Since 1937, the wholesale prices of industrial commodities increased 9.9 per cent but the prices of petroleum products rose only 2.8 per cent.

Luck like this Seldom Happens

Special to The Star-Telegram
[redacted] is having trouble pumping mud in the hole due to the well flowing mud and oil after knocking out bridge that had formed below the casing that had been left in the hole following the abandonment of this test several months ago. Abandoned as dry, below 6,000 feet, the well recently has been showing considerable oil and gas from around top of casing that had been left and the operators are back in the hole making an effort to determine the exact source of the oil showings.

LADY LUCK was on a determined hunt for this operator and found him. Only once in a very blue moon does "Farmer's oil" ever reach the top of the ground; but if the truth were known, more good oil wells have been passed up than oil men will admit to themselves. Passed up, because no core was taken. In this day of rotary tools and high-pressure pumps a porous and permeable sand or lime doesn't have a Chinaman's chance to do more than make a faint rainbow in the pit. Too faint to look interesting. Chances are that is exactly what happened here.

Read the clipping above.

Has this ever happened to you?

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Liberalization of M-68 May Increase Drilling Slightly

DRILLING activity has been accelerated to some extent by OPC's liberalization of the rule placing all wells spudded after December 23, 1941, under the provisions of M-68. In many cases derricks had been built, cellars dug and equipment stacked on the location on December 23 but, for one reason or another, the well was not actually spudded in. By considering that the installation of this equipment was tantamount to spudding, OPC is permitting completion of a number of these wells.

This has led to the belief that a number of exceptions have been granted and that priority orders have been issued by WPB on these exceptions. Actually what has happened is that permission has been granted to border-line cases, involving a question regarding the actual time of spudding or circumstances which caused delay.

Amendment 3, which is reproduced elsewhere on this page, is regarded by operators as indicative of an attempt to liberalize the original order but it is not expected that it will greatly increase the development of fields. Allowing a small amount of leeway from the geographical location which must be drilled or considering that a well at or near the center of a 40-acre tract will conform to any spacing pattern is certainly an improvement over the rigidity of the original order but many companies are in doubt as to the outcome of this liberalization.

Regular Spacing Not Always Possible

Almost every producer knows of cases where conformity to this interpretation would require the drilling of a dry hole on a 40-acre tract offsetting a producer. Fields bounded by a fault, shoestring pools and fields known to be small pimples are the most frequently mentioned in this connection.

Some operators go even farther and point out that the interpretation does not define a field. The Texas Panhandle consists of a single field although there are many separate pools in it. One producer asked if all wells drilled in the future must conform to the first well spudded in the field after December 23. In Kansas where pools are frequently merged, two separate patterns might be set up by wells spudded after December 23 which subsequently became joined. Would the pattern established by the wells in one sector of the new field then operate in the other sector as well?

It has been suggested that the term used by the Oklahoma and Kansas corporation commissions, namely "common source of supply" be used, but this would not conform to OPC's ruling that one well should be drilled to each 40 acres regardless of the number of sands.

There is increasing belief among operators that this amendment is the first step towards a realization of the part of OPC that spacing rules cannot be set up at one point which will be applicable to every producing area in the country. They do not object so much to the 40-acre spacing rule as to the fact that geometry, not geology, is used to govern the location of wells on that 40 acres. They consider that if OPC would retain the 40-acre spacing rule and leave it to state regulatory bodies and the operators concerned to decide on the particular pattern to be used in any specific field, conditions would be so clarified that drilling could be started on a reasonably active scale.

WPB Issues Amendment No. 3 To Conservation Order M-68

WASHINGTON, D. C. — Clarification and relaxation of the uniform well-spacing provisions of Conservation Order M-68 is provided by Amendment 3, issued by the War Production Board, it was announced by Petroleum Coordinator Harold L. Ickes.

Highlights of Amendment 3 on the uniform well-spacing pattern include:

Two Flexible Provisions

The first well spudded in the field after December 23, 1941, in conformance with the provisions of M-68 sets the pattern for the remainder of the field. Wells spudded subsequently must bear the same geographical relationship in the square drilling unit on which they are located as the first well does to its drilling unit.

In all cases, however, spudding at the center location will be considered as conforming to any spacing pattern that has been established by the first well spudded after December 23.

Two provisions allow flexibility to offset physical obstacles: (1) A well may be spudded within a 100-ft. radius of the point of geographical identity as established by the first well spudded in the field after December 23; or (2) a well may be spudded within a 150-ft. radius of the geographic center of a square drilling unit.

Paragraph (b), which applies to all wells spudded after December 23, emphasizes the following points:

1. The drilling unit on which the well is to be located must consist entirely of acreage not attributable to another well.

2. The property line of an oil-drilling unit cannot be closer than 330 ft. to an existing well; a gas-drilling unit cannot be closer than 1,320 ft. to an existing well.

3. A drilling unit that is not square must contain the required area and cannot be more than twice as long as it is wide.

4. No well can be spudded after December 23, 1941, unless all separate property interests within the 40-acre area comprising the drilling unit are consolidated. (This provisions is made to protect small-property owners. It is also the intent of the amendment to make clear that no property "islands" may be formed within a drilling unit.)

5. An oil well must be spudded at least 990 ft. and a gas well 3,960 ft. from any well spudded in the field after December 23, 1941.

6. An oil well must be spudded at least 660 ft. and a gas well at least 2,640 ft. from a well spudded on or before December 23, 1941.

7. An oil well must be spudded at least 330 ft. and a gas well at least 1,320 ft. from any lease, property, or subdivision line that separates unconsolidated property interests.

"Lease equipment" does not include the well, well equipment, pumping or artificial-lifting equipment, flow and gathering lines, pressure-maintenance plants and other plants for the extraction of gasoline and associated hydrocarbons or plants for other treatment or processing of natural gas.

Complete text of Amendment 3 follows:

TITLE 32—NATIONAL DEFENSE
Chapter IX—War Production Board
Subchapter B—Division of Industry Operations
Part 1047—Petroleum

AMENDMENT 3 OF CONSERVATION ORDER M-68

1047.1 Conservation Order M-68 is hereby amended by inserting after paragraph (*c*) thereof a new paragraph (*d*) as follows, and relettering the ensuing paragraphs accordingly:

(d) *Determination of uniform well-spacing pattern.*

1. Subject to the provisions of (2) below, each well "spudded" subsequent to December 23, 1941, in any oil or gas field, other than a condensate field, on any proposed drilling unit consisting of not less than 40 surface acres in the case of any oil field or of not less than 640 surface acres in the case of any gas field, shall be deemed to conform to a "uniform well-spacing pattern" for the purposes of paragraph (*c*) (7) and (8) hereof, where such well is drilled in accordance with the following terms:

(*i*) Each well shall bear the same geographical relationship with respect to the square drilling unit upon which it is to be located as all other wells drilled subsequent to December 23, 1941, bear to the respective square drilling units upon which such wells have been or are to be located; *provided*, that subject to the provisions of (2) below, any well which is to be drilled shall be considered as conforming to a uniform well-spacing pattern where such well is to be located within 100 ft. of the point at which absolute geographic identity would be attained or where such well is to be located within 150 ft. of the geographic center of a square drilling unit; or

(*ii*) Where property interests (including leasehold or other property interests) in irregularly shaped tracts necessitate departures from square drilling units, a well may be located on any drilling unit consisting of not less than the prescribed number of surface acres (40 surface acres in the case of an oil field; 640 surface acres in the case of a gas field); *provided*, that such well is drilled in conformity with the provisions of (2) below.

2. No well "spudded" subsequent to December 23, 1941, shall be considered as drilled in conformity with a uniform well-spacing pattern unless:

(*i*) The proposed drilling unit upon which such well is to be located consists entirely of acreage which is not attributable to any well other than such proposed well. The acreage attributable to wells offsetting the proposed drilling unit shall be determined by assigning to such wells an acreage equivalent to that in the existing well density or drilling pattern contiguous to such wells. In the case of an oil field no portion of a drilling unit shall fall within 330 ft. of an existing well; in the case of a gas field no portion of a drilling unit shall fall within 1,320 ft. of an existing well; and

(*ii*) The direct linear distance between any two points which are farthest removed from each other on the drilling unit upon which a well is to be drilled does not exceed the length of the diagonal of a rectangle whose length is twice its width and which is equivalent in surface acreage to such drilling unit; and

(*iii*) All separate property interests of less than 40 surface acres in the case of an oil field, 640 surface acres in the case of a gas field, or in tracts on which a well cannot otherwise be drilled by virtue of the provisions of this order, surrounding the designated drilling location of any well, are first consolidated with each other, another, or other property interests to form a drilling unit (consisting of not less than 40 surface acres in the case of an oil field; 640 surface acres in the case of a gas field) on which a well may be drilled; and

(*iv*) Such well is drilled at least 990 ft. in the case of an oil field or 3,960 ft. in the case of a gas field from any well "spudded" in such field subsequent to December 23, 1941; and

(*v*) Such well is drilled at least 660 ft. in the case of an oil field or at least 2,640 ft. in the case of a gas field from any well "spudded" or completed in such field on or before December 23, 1941; and

(*vi*) Such well is drilled at least 330 ft. in the case of an oil field or 1,320 ft. in the case of a gas field from any lease line, property line or subdivision which separates unconsolidated property interests.

This amendment shall take effect immediately.

Issued this eighteenth day of February 1942.

Major Changes Forced in Oil Production Quotas for March

WASHINGTON, D. C., Feb. 21.—A major adjustment in production quotas for March certified to the oil states by the Office of Petroleum Coordinator was forced by transportation dislocations. Despite record use of tank cars, the sharp reductions in tanker movement from the Gulf Coast caused OPC to reduce the Texas production quota 85,400 bbl. and make other adjustments, including a raise of 10,000 bbl. in Oklahoma, in an effort to cushion the transportation dislocations.

The nation's production quota for March was fixed at 3,996,800 bbl. daily, a reduction of 105,000 bbl. daily from the February rate. The actual production in March 1941 was 3,579,400 bbl. daily. Quotas were reduced by amounts ranging from 3,000 to 5,900 bbl. daily in Arkansas, California, Louisiana, Kansas, and New Mexico.

The increase of 10,000 bbl. daily in Oklahoma's quota was the most substantial advance authorized by OPC. Wyoming's quota was raised 2,500 bbl. daily and Michigan was authorized to lift its production by the same amount.

"The reduction," explained the OPC release accompanying the tabulated production quotas, "reflects particularly the fact that stocks of crude oil and refined products have been piling up on the Gulf Coast because of transportation difficulties. Accordingly, the recommended rate of Texas crude production is 85,400 bbl. daily lower than that for February.

"The 10,000-bbl. increase in the recommended daily rate for Oklahoma reflects a recent steady decline in stocks of crude of Oklahoma origin, most of which move to Midwest and East Coast centers of demand by pipe line and tank car.

"In determining the rates from month to month, consideration is given first to the indicated current market demand for production from each of the several states. These amounts then are adjusted in the light of considerations involving the relationship of the known reserves of each state to the known crude-oil reserves of the nation, with prior recognition being given to stripper production."

Indications are that reserves played a less important part in establishing the March quotas than in February. The OPC adjustments present the possibility that greater importance is being assigned to demand and transportation considerations, two factors which may continue to exert increasing influence.

Recommended production rates in barrels per day for March, February and the actual daily yield in March 1941 are shown below:

State—	March 1942	February 1942	March 1941
Texas	1,510,600	1,596,000	1,262,500
California	627,000	632,300	598,300
Oklahoma	405,300	395,300	432,400
Illinois	362,500	371,800	330,200
Louisiana	330,000	335,000	295,800
Kansas	245,800	251,700	203,800
New Mexico	114,500	119,300	111,800
Wyoming	80,500	78,000	82,700
Arkansas	71,500	74,500	80,000
Mississippi	55,600	57,400	14,200
Michigan	49,500	47,000	38,100
Pennsylvania	48,200	48,000	44,800
Montana	21,000	20,400	17,500
Indiana	18,000	17,200	19,000
New York	14,500	14,700	14,000
Kentucky	12,000	12,500	10,600
West Virginia	9,600	10,000	9,700
Ohio	9,200	9,000	7,200
Colorado	6,400	6,500	3,600
Nebraska	5,100	5,200	3,000
Other	.....	.....	200
Total	3,996,800	4,101,800	3,579,400

Compact Commission Will Make Estimates of Oil Reserves

OKLAHOMA CITY, Okla., Feb. 23.—In response to a request from Deputy Petroleum Coordinator Robert E. Allen for additional information and estimates of the known available supply of petroleum over the next 3 to 5 years, the executive committee of the Interstate Oil Compact Commission in session here Monday voted to make its own survey of the nation's oil reserves by states, providing the data to the Office of Petroleum Coordinator. The information is expected to be used by OPC in the determination of future production allocations.

The undertaking was referred to the commission's newly created committee on research and coordination. This committee will meet in the near future to work out plans and methods for carrying out the project. Tentatively, the program calls for the information of the separate states to be compiled under the direction of their respective regulatory bodies. However, a uniform method for reporting will be adopted so that there will be no discrimination between states in the estimates.

In Mr. Allen's request for information, six definite questions were asked, namely:

1. At what daily rate can production of the individual states and various fields be sustained over a period of 3 years ending January 1, 1945?

2. At what daily rate can production of the individual states and various fields be sustained over a period of 5 years ending January 1, 1947?

3. What percentage of the estimated rate will be produced by how many wells making 10 bbl. or less daily?

4. What percentage of the estimated rate will be produced by how many wells making 100 bbl. or less daily?

5. What is the estimate of crude-oil reserves and what percentage can be recovered by present known methods of production, including secondary recovery, in the light of present economic conditions?

6. What percentage of the known reserves is possible to be recovered each year?

The executive committee selected Little Rock, Ark., as the next quarterly meeting of the commission, and set March 27-28 as the date.

WPB Issues Amendment No. 1 To Preference Rating Order P-98

WASHINGTON, D. C., Feb. 23.—The War Production Board late last week issued the first amendment to Preference Rating Order P-98, for assisting the petroleum industry to obtain repair and maintenance materials, to eliminate the necessity of obtaining a countersignature from field representatives of the Office of the Petroleum Coordinator when using preference ratings of A-8 or lower in purchasing supplies with a value of less than $500.

The countersignature of district directors must still be obtained when the preference ratings assigned by P-98 are used on any order amounting to more than $500, or on any order for material to be used for new facilities.

Specific permission to use any rating of A-2 or higher must be obtained from the OPC in Washington unless the material is to be used for research or laboratory purposes.

Preference Rating Order P-98 assigns priority ratings from A-1-a to A-10 for deliveries of materials to be used for specified purposes in the production, refining, transportation and marketing of petroleum and petroleum products. As the order was originally issued, these ratings could be used only upon telegraphic authorization from Washington, or when orders were countersigned by district directors of the OPC. The new amendment will permit the use of the lower ratings without countersignature on orders for maintenance, repair and operating supplies when the amount involved is less than $500.

Damage Inflicted by Submarine Off California Coast Slight

LOS ANGELES, Calif.—Early Monday evening a submarine, presumably Japanese, shelled the Elwood field in Santa Barbara County, California, but inflicted only minor damage. The objective was apparently a natural-gasoline plant operated jointly by Barnsdall and Rio Grande Oil companies. Several wells, tanks and other surface equipment are located on the high, steep bluffs that form part of the Elwood field and for this reason it was difficult for the submarine to score direct hits. Most of the estimated 16 shells thudded into the bluffs although a few went over the top and landed harmlessly in the back country farm land. One derrick located on a pumping pier was hit but the only damage was to derrick and pier pumping equipment.

No fires occurred and only minor damage was sustained. It is quite likely that this will be the last time the Elwood field will be shelled as proper steps have been taken to prevent a repetition. This is the first time the California coast line has been shelled, although in attacks by ships early in the war shells and torpedoes have landed in the surf or on rocks lying partially submerged near the tideland.

Operating companies in the Elwood field, comprising Bankline Oil Co., Honolulu Consolidated, Pacific Western, Signal Oil & Gas, Caroline Spaulding and Barnsdall and Rio Grande Oil Co., continued operations during the short shelling.

Appropriation Made For Rubber Plant

LOS ANGELES, Calif., Feb. 24.—Appropriation has been approved for construction of a synthetic-rubber component plant by Bechtel, McCone & Parsons which will cost approximately $32,000,000. Many other details remain undetermined such as whether to operate on butane charging stock, refinery gases, both or to erect a complete refining unit.

Original plans contemplated erection of the new plant adjacent to the Wilmington, Calif., refinery of Union Oil Co. of California which, under such a program, would facilitate acquisition of the raw materials for the synthetic-rubber unit. The plant likely would need an auxiliary supply of butanes if the operation is geared entirely to the gas phase.

The butadiene and styrene produced in the plant will be delivered to a rubber company, reported to be Firestone, for fabrication into rubber products. The plant's production, according to preliminary plans, would be restricted to butadiene and styrene.

Additional equipment in the Union refinery may be linked to the project for recovery of the necessary raw materials.

LIKE A *New Broom*

IN Type G-MV Compressor Units, a rush of **fresh scavenging air** into power cylinders, sweeps each combustion chamber completely clean of exhaust gases. **Better combustion, more power, remarkable fuel economy,** are direct benefits from this unique, **low-pressure Streamlined Scavenging.**

Low-pressure scavenging air means using less engine power to maintain it, gives more power for the real job — compressing. What's more, low pressure air does a *better* job of scavenging.

Other features of Type G-MV include compact V-angle design, Silent-Scot fuel system, oil-cooled pistons, pressure lubrication, interchangeable precision-type bearings, Meehanite Metal for all iron castings, extremely rugged construction throughout.

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INDUSTRY'S MOST FLEXIBLE COMPRESSOR
Convertible from gas to diesel fuel, Type G-MV is built in 400, 600, 800 and 1000-hp units, with a full range of compressor cylinder types.

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ENGINE BUILDERS SINCE 1833

Refiners Study the Effects of Changed Driving Habits

By W. T. ZIEGENHAIN

REFINERS in the various sections of the country are analyzing their gasoline sales records for the past 2 months in order to determine trends and to learn the effects of tire rationing.

The publicity given tire rationing has undoubtedly been a forceful factor in reducing gasoline consumption in the Middle West. Tire rationing has made the motorist conscious of two factors which tend to influence gasoline consumption: (1) miles driven, and (2) speed. It appears to be a safe bet that cutting average car speeds to save tires has been a greater factor in decreasing consumption than the lesser number of cars on the road. The relationship between car speed and gasoline consumption is shown here graphically for a typical group of cars, and it is interesting to note that cutting the speed of the car just 10 m.p.h. from say 50 to 40 m.p.h. the car will consume about 10 per cent less gasoline for a given distance. And, if the car speed is dropped from an average of 60 m.p.h. to 30, the gasoline consumption is cut 40 per cent.

These figures have been used as a basis for comparison because they are the author's best guess of what is actually happening to account for lower gasoline sales here.

PERCENTAGE OF TIRE SERVICE TO BE EXPECTED

Car speed—	Winter	Summer
25 miles per hour	228	109
30 miles per hour	214	103
35 miles per hour	192	92
40 miles per hour	168	81
50 miles per hour	115	56
60 miles per hour	53	25

Effect to Come Gradually

Reduction in speeds was undoubtedly the first factor to be felt. Later in the year refiners will probably see the gradual effect of more people walking or riding buses.

The nation's bus lines have been told to prepare for an increase of 6,000,000,000 passengers in their 1943 operations. It was further reported that of the 28,875,000 passenger automobiles in use in 1941, only 23,000,000 will be in service at the close of 1942. The prediction was further made that by the end of 1943 only 17,000,000 will be on the road.

Probably the most serious rubber wear will come next summer and this will hasten the realization on the part of motorists that they must ride the bus.

One of the leading tire manufacturers has outlined data to show the greatly increased wear on tires in summer compared with winter and when the car is traveling at various speeds. The analysis also permits making a comparison of tire wear under three types of road conditions but for simplicity and use here, the data apply only to tire wear, winter and summer, while the car is being driven over a "rolling" terrain. It applies to the country as a whole and therefore must be viewed as a generality.

Assuming these data are generally conclusive it becomes apparent that tire wear will become greater as the winter season passes into spring and by midsummer tires will be wearing out at about twice the present rate.

Then one may expect further decline in gasoline consumption due to tire rationing. The effect will be cushioned in part at least by industrial developments. Possibly by midsummer, substantial quantities of gasoline will be moved into military use and much might be consumed in the new type vertically propelled merchant ships that promise to be so popular in replacing lost merchant tonnage.

Only to a small extent will the consumption of refined oils be raised by the manufacture of butadiene, styrene, and toluene. The total daily volume of these probably won't exceed 20,000 bbl. daily. This is less than one-half of 1 per cent of our present refined-oil production. However, this does not include our aviation-gasoline-production program, and apparently the refining industry intends to keep well ahead of the demands to be made upon it. In this connection it will be remembered that late last year Secretary Ickes asked refiners to build a combined plant capacity to manufacture 150,000 bbl. daily of 100-octane aviation gasoline. The industry expects to have available by the middle of 1943 and under construction, plants having 250,000 bbl. capacity. In addition, the industry plans to make available sufficient butadiene and styrene by the close of 1943 to enable tire manufacturers to supply 600,000 tons of rubber substitutes annually or the full normal peacetime consumption of raw natural rubber.

This broad program of manufacture represents a major "retooling job" for the refining industry and its effect is to divide the industry into two groups—those who take government contracts to supply special war materials and those who do not. Obviously, the latter will depend upon current domestic demands for ordinary motor fuel, motor and industrial lubricants, industrial fuels and household distillate fuels to keep them going. This group represents the majority of refiners in number but each is small. Collectively, they represent possibly 80 per cent of the number of refiners, but probably do not account for more than 40 per cent of the plant capacity. Thus, the war is tending to further diversify the large refiners and make them larger.

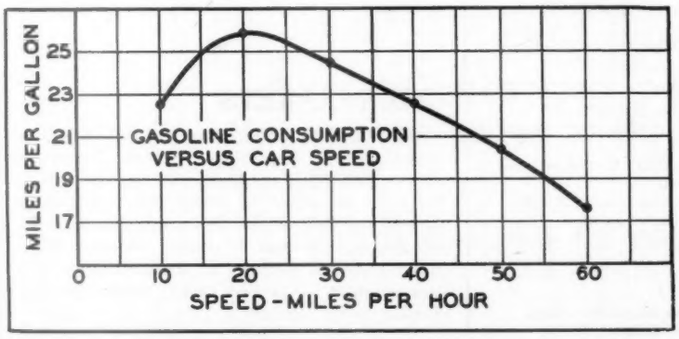

Chart shows gasoline consumed at various car speeds. Until tire rationing the motorist was concerned about saving time. Now he wants to save tires and gasoline

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OPA Issues Amendment No. 3 to Schedule 88

ONE sales-reporting requirement asked of sellers, now deemed unnecessary, is removed from Price Schedule 88 for petroleum and petroleum products by Amendment 4, announced February 19 by Leon Henderson, administrator of the Office of Price Administration. The amendment affects only sales made between February 2, 1942, and March 1, 1942.

Under a previous amendment—No. 2, issued February 7, 1942—fixing a price ceiling on petroleum products under Section 6 (#) in Appendix A, sellers were permitted to sell, until March 1, 1942, products at the market price prevailing at the time of sale, "providing, however, that notice of such price and sale is furnished to this office within 10 days after such sale."

Amendment 4 changes this provision to read: "Provided, that notice of the sale and the price thereof is furnished to this office, within 15 days after the sale, when the price is in excess of the last sale of a product of similar quality made by the seller prior to November 7, 1941."

The amendment, declared effective as of February 2, 1942, affects only an alternative method of determining maximum prices and does not affect maximums set at lowest quoted prices published in certain designated trade publications on specified dates.

Full text of the amendment follows:

TITLE 32—NATIONAL DEFENSE
CHAPTER XI—OFFICE OF PRICE ADMINISTRATION
Part 1340—Fuel

Amendment No. 4 to Price Schedule No. 88—Petroleum and Petroleum Products

Section 1340.159(b)(6)(ii) is amended to read as set forth below.

1340.159 *Maximum prices for petroleum and petroleum products.*

(b) Petroleum products.

(6)(ii) Where the maximum price for products at a given shipping or delivery point cannot be determined under (i) above, sellers may sell such products at the market price prevailing at the time of the sale: *Provided,* That notice of the sale and the price thereof is furnished to this office, within 15 days after the sale, when the price is in excess of the prices of the last sale of a product of similar quality made by the seller prior to November 7, 1941.

(Pub. No. 421, 77th Cong., 2d sess.)

This Amendment No. 4 shall become effective as of February 2, 1942.

Issued this 17th day of February 1942.

LEON HENDERSON,
Administrator.

Barge Line Attacks Move of Petroleum Carrier Corp.

WASHINGTON, D. C., Feb. 23.—Application of Petroleum Carrier Corp. for permission to transport petroleum products by barge from Port Arthur and Houston, Tex., refinery districts to Nashville, Tenn., points on the Warrior River and its tributaries, and points on the Gulf Coast from Louisiana to Miami, Fla., was the subject of strong attacks by a group of Mississippi River barge lines last week.

The protests were based on the allegation that there is no need for such services as it is already being given by existing lines, and the charge that the Petroleum Carrier Corp. has been operating in "violation of the transport act," and that the Interstate Commerce Commission should not countenance such operations.

Allen Becomes Assistant Deputy Coordinator; Knowlton Heads Production Division, OPC

Robert E. Allen, who has been director of the production division of the Office of Petroleum Coordinator, has been elevated to assistant deputy petroleum coordinator. (See Page 127 for biographical sketch of Mr. Allen.) He has been succeeded in his former post by Donald R. Knowlton, who is on leave of absence from Phillips Petroleum Co., where he is general superintendent in the production department. Mr. Knowlton joined Phillips as a petroleum engineer in 1926, his first job being at Borger, Tex. He rose to assistant to the chief engineer, and later to chief engineer.

A graduate of University of Colorado, and with a petroleum engineering degree from Leland Stanford University, Mr. Knowlton began his oil experience in 1916, with Empire Oil & Refining Co., later working for Marland Oil Co. and Shell. During the first World War he was in the meterological service of the Signal Corps, serving overseas.

Mr. Knowlton is a native of Iowa. He and Mrs. Knowlton have three children.

OPC Occupies Unique Relationship With WPB

WASHINGTON, D. C., Feb. 20. — Relationships of the Office of Petroleum Coordinator and the War Production Board in the matter of extending priority assistance to the oil business are functioning more smoothly but there is still "room for improvement." This was Coordinator Ickes' reply to a question at his press conference here yesterday as to whether the relationship between the two government agencies had shown any improvement over earlier weeks of the WPB's existence.

There appears to be less discussion in Washington over the possibility that OPC may be absorbed by the WPB. The OPC continues to function as the petroleum-industry branch of the WPB, a relationship that is unique in that other industries such as copper, chemical, steel, and machine tools are direct branches of WPB and a part of its general organization.

Donald M. Nelson, director of WPB, repeated this week that he has no plans for changing the relationship with OPC. This does not necessarily mean, however, Washington observers point out, that OPC will continue indefinitely as a separate entity in the event conditions change.

CONDENSED DIRECTORY OF PERSONNEL OF THE OFFICE OF PETROLEUM COORDINATOR

Interior Department (New Building) 18th and C Streets, N.W. Phone Republic 1820

Coordinator.—Harold L. Ickes, room 6156, extension 500.
Deputy Coordinator.—Ralph K. Davies, room 6654, extension 3831-2; Gordon Sessions, room 7519, extension 2621, special assistant to deputy coordinator.
Assistant Deputy Coordinator.—Robert E. Allen.
Deputy Coordinator's Staff.—(Sixth and seventh floors, New Interior Building). Charles J. Deegan, room 6420, extension 4735; H. Chandler Ide, room 6654, extension 3833; James Moore, room 6648, extension 4796; J. Elmer Thomas, room 6420, extension 4735.
Production Division.—D. R. Knowlton, director, room 6070, extension 3334; Paul Raigorodsky, assistant director in charge of natural gas, room 7423, extension 4774.
Refining Division.—Wright W. Gary, director, room 6637, extension 3233.
Transportation Division.—H. A. Gilbert, director, room 6629, extension 4418.
Marketing Division.—John W. Frey, director, room 6623, extension 4646.
Research Division.—Edward B. Swanson, director, room 7313, extension 749.
Conservation Division.—Everett Lee De Golyer, director, room 7516, extension 4459.
Materials Division.—William F. Huff, director, room 7514, extension 4585.
Legal Division.—J. Howard Marshall, chief counsel, room 6649, extension 4100.
OPM Priority Consultant.—James E. Hughes, room 7416, extension 4616.
Executive Officer.—Stanley W. Crosthwait, room 6515, extension 4363.
Liaison.—Gen. Walter B. Pyron, liaison agent between Army Department and OPC. Phone Republic 7600, extension 6044, room 6261, New War Department Building.
Information Division.—Herbert A. Yocom, director, room 7513, extension 3844.
Foreign Division.—J. T. Duce, director, room 7444, extension 4417.

DISTRICT OPC OFFICERS

DISTRICT 1
122 East Forty-second St., Chanin Bldg., New York City

Production Section.—James R. Wylie, Jr., district director.
Natural-Gas and Natural-Gasoline Section.—Frank M. Brewster, chief.
Refinery Section.—Distin W. Wilson, district director.
Marketing Section.—Louis H. Spinner, district director and acting director in charge.
Legal Section.—Charles L. Harding, district counsel.

DISTRICT 2
120 South La Salle St. Bldg., Chicago, Ill.

Production Section.—Wirt Franklin, district director and director in charge.
Refinery Section.—Douglas P. Bailey, district director.
Transportation Section.—Walter Dumont, district director.
Materials Section.—Edward E. Robbins, district director.
Legal Section.—Charles K. Schwartz, district counsel.

DISTRICT 3
245 Mellie Esperson Bldg., Houston, Tex.

Production Section.—Grady H. Vaughn, district director for production.
Natural-Gas and Natural-Gasoline Section.—D. E. Buchanan, chief of section.
Refinery Section.—G. T. Granger, district director.
Legal Section.—J. P. Rice, district counsel.
Conservation Division.—W. J. Murray, Jr., conservation engineer.

DISTRICT 4
817 Seventeenth St., United States Natl. Bank Bldg., Denver, Colo.

Production Section.—Michael J. Foley, district director.
Refinery Section.—Earl Petty, district director.

DISTRICT 5
417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

Production Section.—Lt. Comdr. Wentworth H. Osgood, district director and director in charge.
Natural-Gas and Natural-Gasoline Section.—Reed W. Garman, assistant chief.
Conservation Section.—Everett Trostel, district conservation engineer.
Refinery Section.—Harold Sydnor, district director.
Materials Section. — Charles T. Reichert, district director.
Transportation Section.—Dale Gibson, acting district director.
Marketing Section.—Charles B. Garretson, district director and assistant director in charge.
Legal Section.—Clyde Thomas, district counsel.

DEATHS

CHARLES FREDERICK GROSS, 74, retired oil producer, banker and philanthropist, Cambridge, Ohio, died February 2, following a heart attack suffered the day before. Mr. Gross, a native of Ohio, entered the oil fields at the age of 21. For many years he was associated with Carnill & Gross Brothers, oil producers. He retired from active interest in the business several years ago. His widow and a daughter survive.

SAM G. HODGES, 51, oil operator and drilling contractor, Abilene, Tex., died February 16 at his home in Abilene. He had been ill for several months.

PAUL BEVANS, 35, oil gager for Shell Pipe Line Corp., died at a Midland, Tex., hospital after several days' illness. His widow and four children survive.

GEORGE E. GODDARD, 54, manager of the oil-production division of Cities Service Oil Co., Bartlesville, Okla., died February 22 at his home in Bartlesville. Death followed a severe heart attack. Mr. Goddard had not been in good health since he suffered an attack while en route to the fall convention of the American Petroleum Institute in Chicago in 1940, but he had recovered sufficiently to take care of his job. He had worked at his office the day before he died, and had attended a reception that night. His widow, a son and a daughter survive.

J. F. OWENS, 63, chairman of the board of Oklahoma Gas & Electric Co., Oklahoma City, Okla., died February 20 at his home in Oklahoma City after a heart attack. Mr. Owens was vice president of the United States Chamber of Commerce. Survivors include his widow, a daughter and two sons.

JOHN H. WILLIAMS, 60, who was associated with many of the Alberta, Canada, pioneer oil companies, died recently at Calgary, Alta.

●

THE MARKETS*

CRUDE OIL: Drastic pipe-line rationing of the crude market in portions of West Texas, New Mexico and the Panhandle was imposed late last week in an effort to offset the transportation jam on the Gulf Coast. The crude market is firm enough but the jam of normal transportation is forcing radical changes in the routine of crude and products to the East Coast. Several problems remain to be solved.

REFINERY PRODUCTS: Refinery gasoline and natural-gasoline prices in Group 3 territory softened this week as did markets on the Gulf Coast. Because of shortages on the East Coast prices for products in that area continued at firm levels.

TANK WAGON AND POSTED DEALER: This phase of market is steady and unchanged. Demand for motor gasoline has continued at levels prevailing before tire rationing.

FINANCIAL: Oil securities drifted into lower ground, yielding to the threat of rationing consumption, curtailed drilling and the tangled transportation situation. Average of 30 representative stocks for the week ended February 14: High, 23.37; low, 22.53; close, 22.81. Week ended February 7: High, 23.90; low, 23.25; close, 23.47.

*Detailed information in the market section.

Tuning up for war

The "defense program" was on when the Dubbs-cracking unit in the Sunray refinery at Allen, Oklahoma, started a long, non-stop run at noon on August 5, 1941

The defense program was still on when the unit was shut down at 6 a. m. on November 18, after running 2514 hours on Allen crude and topped crude, producing 62.81 percent of Dubbscracked gasoline — a remarkable performance

F L Martin, vice-president in charge of refining writes:

> "The shutdown on this run was not compulsory; the plant was brought down for routine inspection and cleanout"

Now it's an all-out war program Sunray's Dubbs unit and Sunray's organization are tuned up for war production Long, continuous runs and high yields of gasoline are more important now than ever

Every Dubbscracking unit is a war unit now Every hour added to Dubbscracking time is of vital value

Congratulations to you, Mr Martin, and to your men

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

"Welding would bank $2100 for me here"

What can I learn from this peace-time product to guide me in making plans for the post-war Battle for Business?

ALTER EGO: Well, the first big lesson is that the manufacturer points out that if this $900 car were built by the non-welding methods of 15 years ago, the cost would run $3000.

That's a saving of $2100 by welding and mass production. Could it be possible for me to apply the same method to my product to cut costs and boost volume for the tough years ahead?

ALTER EGO: You know there is a simple *plan* for changing over to welding, like that of the auto builders:

(1) Appoint a man of experience and give him authority to supervise welding developments.

(2) Change over to welding gradually . . . one design at a time.

That sounds familiar. Doesn't The Lincoln Electric Company of Cleveland, Ohio, recommend that plan? Why not write them, state our application and ask for suggestions for changing over?

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

Natural Gasoline

Natural-Gasoline Industry Destined For Important War Role

THE natural-gasoline branch of the petroleum industry is prepared to play an increasingly important part in the war effort according to a report by the Bureau of Census of the Department of Commerce. The bureau points out that butane, isobutane, isopentane, and some of the other hydrocarbons extracted at plants are important basic materials for making high-octane aviation gasoline and, with the exception of isopentane, for the manufacture of synthetic rubber. In the past only a small fraction of the natural-gasoline output has been used for these purposes.

The Bureau of Census in its latest complete report* covers natural-gasoline plant operations up to 1939. The industry employed an average of 8,332 wage earners in 1939 and paid a total of $13,212,000 in wages—an average of 79 cents per man-hour. Salaried employes, of whom there were 2,005 in October, were paid $5,052,000. Expenditures during the year for supplies and materials (excluding natural gas treated) totaled $8,653,000; for fuel, $6,600,000; for purchased electric energy, $355,000; and for work done on contract, $3,984,000. These principal expenses totaled $37,856,000. Profits or losses cannot be calculated by subtracting these expenses from the value of products.

Buildings erected and machinery and equipment installed during the year cost $13,030,000. Of this amount, $11,569,000 represented expenditures for machinery and equipment; the remainder was spent for new buildings and major alterations to existing structures. These figures on capital expenditures include installation costs, which are partly duplicated in other expenses reported.

*Complete copies available from J. C. Capt, director, Bureau of Census, Washington, D. C.

Production

Natural gasoline was produced by 734 plants in 1939 compared with 1,115 plants in 1919. The compression method, which accounted for three-fourths of the natural-gasoline production in 1919, supplied only 13 per cent of the 1939 output. The absorption process, in which gasoline is extracted by bringing the natural gas into contact with oils heavier than gasoline, was used in the recovery of 78 per cent of the total output in 1939. Charcoal absorption accounted for 0.3 per cent, and combinations of compression and absorption methods accounted for over 9 per cent of the production. Of the total number of active plants in 1939, 368 used the absorption method; 8, the charcoal method; and 44, a combination of methods. Natural-gasoline plants in Texas produced 760,793,000 gal.; those in California, 604,597,000 gal.; and those in Oklahoma, 428,107,000 gal. These three states accounted for 84 per cent of the total production.

Although the quantity of natural gasoline produced in 1939 was almost five times that of 1919, the total value of the gasoline was only 11 per cent higher, the average value per gallon at plants having declined from 17.3 cents in 1919 to 4.1 cents in 1939. Other products of natural-gasoline plants in 1939 were valued at $8,595,000. These products included liquefied petroleum gases valued at $7,156,000.

Natural Gas

Natural Gas Section, A.G.A., Will Meet in New Orleans

The annual convention of the natural-gas section of the American Gas Association has been scheduled for May 4-7, at New Orleans, La. A program is being arranged which it is hoped will be helpful in plotting a course through the present maze of uncertainties. The two sessions of the production conferences that are planned will be in the form of symposia, one on "Drilling and Completion in High-Pressure Areas," and the other on "Proper Production Methods." Represented on the program will be men from the producing areas in Oklahoma, Louisiana, Ohio, Texas, Pennsylvania and California.

COMPOSITE PRICE SCHEDULE OF CALIFORNIA NATURAL GASOLINE IN CENTS PER GALLON

R.v.p. lb./sq. in. at 100° F.	Santa Fe Springs	Long Beach	Seal Beach	Huntington Beach	Coyote Hills	Montebello	Brea	Richfield	Inglewood, Torrance, El Segundo	M'way-Sunset, Lost Hills, North Belridge	Kettleman Hills, Mountain View	East Coalinga, Rio Bravo, Greeley, Canal, Coles Levee	Wilmington	Ventura Avenue	Capitan	Dominguez	Rosecrans	Playa Del Rey	Santa Maria
15-15.9	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	4.75	4.75	4.75	5.25	5.00	4.57	5.25	5.25	5.25	5.00
16-16.9	5.16	5.16	5.17	5.15	5.16	5.16	5.16	5.16	5.18	4.67	4.67	4.66	5.16	4.92	4.50	5.16	5.16	5.17	4.91
17-17.9	5.07	5.07	5.08	5.06	5.08	5.07	5.08	5.08	5.11	4.58	4.58	4.56	5.07	4.82	4.42	5.07	5.07	5.08	4.82
18-18.9	5.01	4.98	5.00	4.97	4.99	4.98	4.99	5.00	5.04	4.50	4.49	4.47	4.98	4.73	4.35	4.98	4.97	5.00	4.74
19-19.9	4.95	4.88	4.92	4.87	4.91	4.89	4.90	4.91	4.96	4.41	4.41	4.38	4.89	4.64	4.27	4.89	4.89	4.94	4.65
20-20.9	4.90	4.79	4.84	4.82	4.82	4.79	4.82	4.83	4.90	4.33	4.32	4.28	4.80	4.55	4.19	4.81	4.80	4.89	4.56
21-21.9	4.85	4.74	4.76	4.77	4.73	4.71	4.74	4.74	4.84	4.26	4.24	4.19	4.71	4.46	4.13	4.75	4.75	4.83	4.48
22-22.9	4.80	4.69	4.69	4.72	4.65	4.65	4.65	4.66	4.78	4.19	4.15	4.10	4.62	4.38	4.05	4.70	4.70	4.78	4.43
23-23.9	4.75	4.63	4.62	4.67	4.57	4.58	4.56	4.61	4.72	4.12	4.07	4.01	4.53	4.28	3.99	4.65	4.65	4.74	4.37
24-24.9	4.70	4.58	4.55	4.62	4.48	4.52	4.47	4.55	4.67	4.05	3.98	3.91	4.44	4.19	3.91	4.60	4.60	4.71	4.32
25-25.9	4.70	4.53	4.49	4.56	4.41	4.46	4.43	4.50	4.62	3.98	3.90	3.82	4.33	4.07	3.85	4.57	4.59	4.70	4.26
26-26.9	4.69	4.48	4.44	4.49	4.33	...	4.38	...	4.57	3.93	...	3.74	4.21	3.96	...	4.57	4.58	5.68	...
27-27.9	4.68	4.43	4.40	4.44	4.25	...	4.33	...	4.53	3.88	...	3.66	4.09	3.83	...	4.55	4.58	4.66	...
28-28.9	4.66	4.42	4.35	4.40	4.18	...	4.29	...	4.48	3.84	...	3.57	3.99	3.72	...	4.54	4.57	4.65	...
29-29.9	4.64	4.41	4.32	4.38	4.11	...	4.26	...	4.44	3.81	...	3.49	3.88	3.64	...	4.54	4.56	4.63	...
30-30.9	4.63	4.39	4.28	4.34	4.00	...	4.24	...	4.36	3.74	...	3.33	3.80	3.56	...	4.51	4.55	4.59	...
31-31.9	4.63	4.39	4.28	4.34	4.00	...	4.24	...	4.36	3.74	...	3.33	3.74	3.52	...	4.51	4.55	4.59	...
32-32.9	4.59	4.36	4.25	4.31	3.96	...	4.22	...	4.29	3.69	...	3.17	3.69	3.48	...	4.49	4.54	4.54	...
33-33.9	4.59	4.36	4.25	4.31	3.96	...	4.22	...	4.29	3.69	...	3.17	3.66	3.44	...	4.49	4.54	4.54	...
34-34.9	4.55	4.34	4.23	4.28	3.93	...	4.19	...	4.22	3.67	...	3.05	3.62	3.42	...	4.47	4.52	4.47	...
35-35.9	4.55	4.34	4.23	4.28	3.93	...	4.19	...	4.22	3.67	...	3.05	3.60	3.41	...	4.47	4.52	4.47	...
36-36.9	...	...	...	...	...	...	4.16	...	4.15	3.66	...	2.97	3.59	3.39	...	4.40	4.49	4.39	...
37-37.9	...	...	...	...	...	...	4.16	...	4.15	3.66	...	2.97	3.55	3.38	...	4.40	4.49	4.39	...
38-38.9	...	...	...	...	...	...	4.12	...	4.10	...	...	2.92	3.54	3.36	...	4.27	4.42	4.27	...
39-39.9	...	...	...	...	...	...	4.12	...	4.10	...	...	2.92	3.52	3.34	...	4.27	4.42	4.27	...
40-40.9	...	...	...	...	...	...	4.07	...	4.04	...	...	2.89	3.51	3.33	...	4.13	4.31	4.13	...
41-41.9	...	...	...	...	...	...	4.07	...	4.04	...	...	2.89	3.48	3.30	...	4.13	4.31	4.13	...
42-42.9	...	...	...	...	...	...	4.01	...	4.00	...	...	2.87	3.47	3.29	...	3.99	4.17	3.99	...
43-43.9	...	...	...	...	...	...	4.01	...	4.00	...	...	2.87	3.45	3.28	...	3.99	4.17	3.99	...
44-44.9	...	...	...	...	...	...	3.94	...	3.95	...	...	2.85	3.44	3.26	...	3.84	4.02	3.84	...
45-45.9	...	...	...	...	...	...	3.94	...	3.95	...	...	2.85	3.42	3.24	...	3.84	4.02	3.84	...
46-46.9	...	...	...	...	...	...	3.86	...	3.90	...	...	...	3.39	3.22	...	3.69	3.87	3.70	...
47-47.9	...	...	...	...	...	...	3.86	...	3.90	...	...	...	3.37	3.20	...	3.69	3.87	3.70	...
48-48.9	...	...	...	...	...	...	...	...	...	...	...	...	3.36	3.18	...	3.55	3.72	3.56	...
49-49.9	...	...	...	...	...	...	...	...	...	...	...	...	3.33	3.17	...	3.55	3.72	3.56	...
50-50.9	...	...	...	...	...	...	...	...	...	...	...	...	3.32	3.16	...	3.41	3.58	3.42	...
51-51.9	...	...	...	...	...	...	...	...	...	...	...	...	3.30	3.14	...	3.41	3.58	3.42	...
52-52.9	...	...	...	...	...	...	...	...	...	...	...	...	3.28	3.12	...	...	3.43	...	...
53-53.9	...	...	...	...	...	...	...	...	...	...	...	...	3.27	3.10	...	...	3.43	...	...
54-54.9	...	...	...	...	...	...	...	...	...	...	...	...	3.25	3.08	...	...	...	...	...
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56-56.9	...	...	...	...	...	...	...	...	...	...	...	...	3.21	3.05	...	...	...	...	...
57-57.9	...	...	...	...	...	...	...	...	...	...	...	...	3.20	3.03	...	...	...	...	...
58-58.9	...	...	...	...	...	...	...	...	...	...	...	...	3.17	3.02	...	...	...	...	...
59-59.9	...	...	...	...	...	...	...	...	...	...	...	...	3.15	3.00	...	...	...	...	...
60-60.9	...	...	...	...	...	...	...	...	...	...	...	...	3.13	2.99	...	...	...	...	...
61-61.9	...	...	...	...	...	...	...	...	...	...	...	...	3.12	2.95	...	...	...	...	...
62-62.9	...	...	...	...	...	...	...	...	...	...	...	...	3.10	2.94	...	...	...	...	...
63-63.9	...	...	...	...	...	...	...	...	...	...	...	...	3.08	2.94	...	...	...	...	...
64-64.9	...	...	...	...	...	...	...	...	...	...	...	...	3.06	2.93	...	...	...	...	...
65-65.9	...	...	...	...	...	...	...	...	...	...	...	...	3.04	2.91	...	...	...	...	...
66-66.9	...	...	...	...	...	...	...	...	...	...	...	...	3.02	2.90	...	...	...	...	...

Facts Worth Knowing . . . . by THE GIRDLER CORPORATION

GIRBOTOL PROCESS

TO SWEETEN EXTREMELY SOUR GAS AT McKAMIE FIELD!

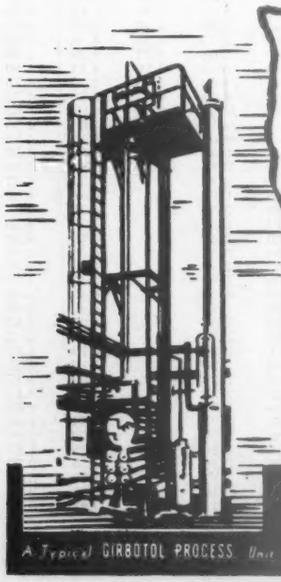
GIRBOTOL PROCESS SELECTED TO PURIFY 25,000,000 CUBIC FEET OF McKAMIE GAS PER DAY.. CONTAINING 4,500 GRAINS OF H_2S PER 100 SCF!

McKamie field gas is the sourest ever to be purified for the utilities market. Treated by the Girbotol Process, the gas will pass the sensitive Bureau of Standards lead acetate test!

GAS FACTS IN SO. ARKANSAS FIELDS

FIELD	CLASS	H_2S GRAINS per 100 cu. ft.	CO_2% by volume
SCHULER	Oil & Gas	30	4.9
ATLANTA	Oil & Gas	860	.....
VILLAGE	Oil & Gas	1500	6.2
MAGNOLIA	Oil & Gas	1500	3.4
BIG CREEK	Gas	360	.....
MACEDONIA	Gas	2400	2.0
DORCHEAT	Gas	1945	4.3
McKAMIE	Gas	4500	.....
PATTON	Gas	9000	.....

FROM OIL & GAS JOURNAL



A Typical GIRBOTOL PROCESS Unit

INCREASES HEATING VALUE OF GAS BY REMOVING 5% CO_2 CONTENT!

Girbotol Process not only removes the high H_2S content from McKamie gas, making it commercially salable—but CO_2 is removed simultaneously—which increases the heating value of the gas!

PREVENTS HYDRATE FORMATION IN TRANSMISSION SYSTEMS!

Dehydration is an important additional advantage of the Girbotol Process—to prevent the formation of hydrates in the pipe line transmission system, and thereby maintain peak capacity on pipe lines.

GIRBOTOL PROCESS is a simple, cyclic process for the separation of acidic constituents from gaseous mixtures. In cycle and equipment the process is similar to gasoline absorption. For further information on this economical purification process now in 110 plants, write to THE GIRDLER CORPORATION, Louisville, Ky., U.S.A.

ENGINEERING AND OPERATING SECTION

FEBRUARY 26, 1942

Closed Siphon System Handles Disposal Water at Tinsley

By R. MARNE SANFORD

The first subsurface salt-water disposal project in the Tinsley, Mississippi, field belongs to the Union Producing Co. It is a closed system with the water being injected into the Wilcox sand at 2,880 ft. High iron content of the water makes exclusion of air essential.

THE Tinsley field, Mississippi's first oil discovery, and the only one of major size, has for the past year been troubled with the quantity of salt water produced with the oil. Heretofore all water produced has been drained into large lease evaporation pits, but this was impractical due to the porous and permeable nature of the soil which prevented the water from remaining in the pits.

Union Producing Co., Shreveport, La., discoverer and largest producer in the field, several weeks ago became the first to install a subsurface salt-water disposal system. The company has constructed 5 miles of gathering lines, drilled a salt-water injection well to 2,880 ft., and erected tanks, filters, pumps, and connections necessary for the plant's operation.

It is an entirely closed, pressure-operated system and employs several practices previously not applicable to subsurface salt-water disposal systems. The iron content of Tinsley field brine is exceptionally high. If either the oil emulsion or the salt water were exposed to the atmosphere, the precipitated iron oxide would clog the gathering lines and the disposal system.

Most unusual of the entire system is the disposal well. Drilled to the shallow Wilcox sands at 2,880 ft., the well started flowing salt water when tubing was run. A pressure-injection system was used to counteract the natural pressure and water flow of disposal sand. However, since starting operation of the unit, the disposal well will, by suction, siphon water at the rate of 140 bbl. hourly, or 3,360 bbl. daily. While salt water is being siphoned down into the well through the casing, formation water will flow out of the disposal well through the tubing. Pressure differentials in the sand section and specific-gravity differences in the salt water are offered as explanations for this phenomenon.

Producing Equipment

The plant used by Union Producing Co. for disposal of approximately 1,500 bbl. of water daily produced with the oil from the Woodruff sand zone is designed to operate at a daily capacity of about 3,360 bbl. under the siphon system and approximately 6,000 bbl. daily under the pump-pressure system. There are some 50 wells in the field making large amounts of water, and in addition almost all of the more than 300 Woodruff zone wells are making appreciable water and in increasing quantities.

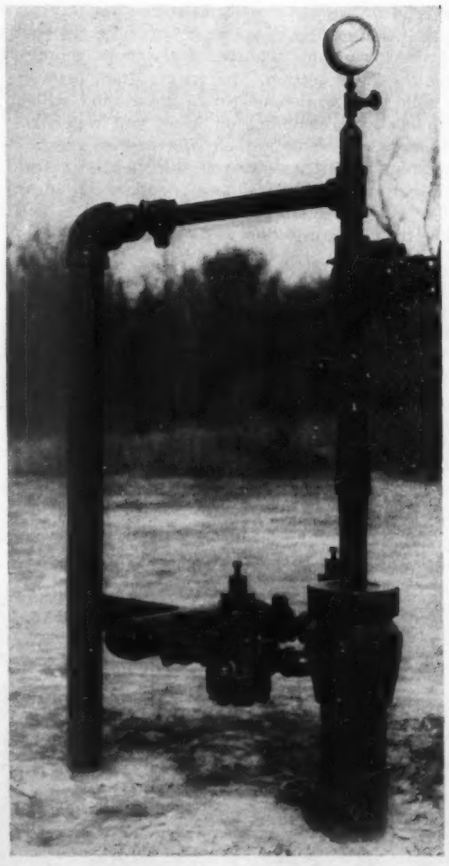
The system is injecting water produced from 10 leases which embrace 10 treaters and 10 tank batteries. The disposal well and input system are located in the northwestern part of the field, with two field combination skimming and volume tanks located one each in the northern and southern ends of the field.

The north end and south end volume tanks are identical and serve the leases in their respective areas, while the central injection system serves as the volume tank for wells in its area. The oil treaters, of the automatic water-knockout type, operate under approximately 15 lb. pressure in the continuous closed system with the water.

Gathering System

The purposes of the outlying field volume tanks are to act as preliminary skimming tanks and as water booster stations to force the flow over the hilly terrain of the field and up to the water-injection plant. The water enters the 250-bbl. field volume tanks from the treater batteries through 4-in. inlet lines. Each tank is equipped with a 2-in. gas equalizer line and from 3 to 5-lb. pressure is maintained on these tanks at all times.

The tanks fill about once each 8 hours and



The salt-water injection well. Note the 4-in. header with the two 2-in. lines going direct to the casing-head installation of the well. Hydrostatic pressure from the formation is maintained on the tubing, even while water is being siphoned into the formation through the casing

under the present temporary plan are not automatic, that is, the pumps are started by hand. When the installation of equipment is complete, these field volume tanks will be entirely automatic with mercury switches connected to electric motors.

At present the 4 by 6-in. pumps on the two field volume tanks are driven by 220-hp. gasoline engines. Each tank has an oil draw-off line near the top to insure against any oil content ever reaching the filter beds of the injection plant. About 40 to 50 lb. pump pressure is required to force the water to the injection plant. With a pump operating capacity of 125 bbl. per hour, it requires about 2 hours to pump out each of the two 250-bbl. field tanks.

The oil from the draw-off lines of each of the field tanks is run back through the treaters ahead of each of the tanks and is recovered as usable oil.

Disposal Plant

Both field volume tanks have 4-in. lines leading to the central injection system and these two lines, together with the 4-in. line from the centrally located battery of treaters, enter directly into the filter tank. The circular, 10 by 20 ft., welded-steel filter tank is divided, horizontally, into two separate compartments. The water enters the top compartment, still under from 3 to 5 lb. pressure, through a 6-in. inlet line. This top compartment acts as another skimming tank and any oil scum accumulating on the surface is automatically siphoned off and returned to the central battery of treaters for recovery. The water is siphoned off through a 6-in. line at a lower level in this upper compartment, run out through a U-section of 6-in. pipe and reenters the top part of the lower compartment of the tank containing the filter section. The water filters through a solid 2-ft. section of No. 2 grain sand which catches any remaining oil scum and water impurities. The water is then siphoned off the bottom of the filter section below the filter beds through a 6-in. outlet and enters the main 10 by 40-ft. volume or storage tank from which it goes directly to the injection well.

The fluid level in the filter tank is controlled by an automatic water draw-off valve which trips open when the water volume exerts the necessary pressure on the plate. At one end of the filter tank is a small gas scrubber and also the control meter for the gas-pressure system.

The 6-in. water outlet line from the filter section of the tank is equipped with a bypass line from the bottom of the volume or storage tank. Being on the downstream side of the flow, it furnishes the water necessary for backwashing the filter beds. Water is forced up through the filter beds and passes out of the filter section near the top of the compartment through a 6-in. line. This line runs about 50 ft. away from the plant and empties into a three-compartment evaporation pit. The waste water drawoff line has a bypass which allows a portion of the water flow to be directed into a small sampling box. This catches specimens of the water for examination of sediments and oil content from the filters.

The filter beds are backwashed about once a week at present but as the daily water volume handled increases, it will become necessary to backwash more frequently.

Siphon-System Operation

The 10 by 40-ft. central volume or water-storage tank has a 4-in. outlet to the injection well. The entire plant was first designed to use a 5 by 10-in. pump, by means of which the water was to be forced into the injection well. When it was found that water would siphon into the well, a bypass was installed to eliminate the pump altogether. The line through the pump is still intact, however, for at some future date the siphoning action of the well may cease and it will become necessary to resort to the pressure system of injection.

Operating through the pump, which is driven by a 500-hp. gasoline engine, the system was first capable of disposing of 49 bbl. of water per hour; however, when the pump was bypassed the system would siphon 96 bbl. per hour, or almost double the capacity. In order to increase the capacity still more, a 4-in. header with two 2-in. drawoff lines was installed on the injection well head, and the capacity of the system was increased to 140 bbl. per hour. It does not operate at full capacity as yet, for not enough wells are connected to the disposal system.

Should the siphon effect of the well cease after the operating capacity of the system has increased, the pump is capable of handling 240 bbl. per hour of water when operated under 40 lb. pressure.

The 4-in. drawoff line from the water-storage tank is equipped with an automatic shutoff which closes the gate valve when the water volume in the tank is low. Plans are under way to portion out the flow from this storage tank so that when not operating at capacity, some water will be entering the injection well at all times. It is feared intermittent injection may cause a partial plugging of the disposal zone.

Injection Well

Since the ability of a disposal well to take water determines the amount of care which must be taken in preparation of the water for injection, the free siphoning effect of this Wilcox sand well eliminates any actual water treatment before injection. One of the greatest aids to easy salt-water disposal is an available formation having a high porosity and permeability which does not already contain fluid. The 2,800-ft. Wilcox sands of the area offered all of these features except that it already contained water.

The injection well, remarkably, is located fully 30 ft. higher (being on the side of a hill), than the water-storage tank from which the water is siphoned.

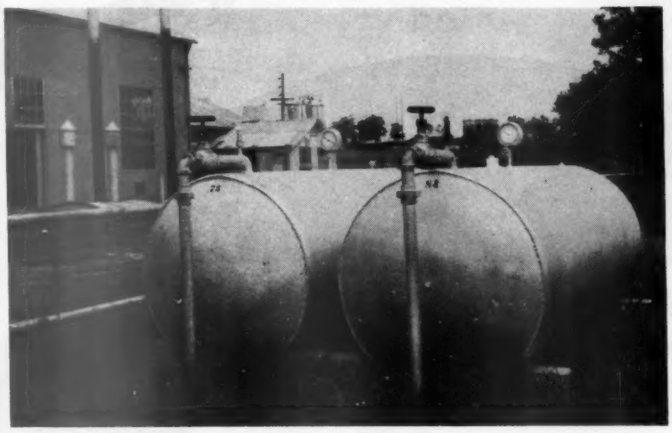
Drilled to a total depth of 2,880 ft., the Wilcox sand was topped at 2,816 ft. in the injection well. The 7-in. casing is cemented at 2,814 ft. with 5-in. liner opposite the sand face. There are 23.18 ft. of blank liner and 66.54 ft. of perforated liner in the well.

The entire system has been in operation since the middle of January and has performed so satisfactorily that several other producers in the field are preparing to install individual or jointly operated systems with neighboring producers.

Above: One of the two outlying combination skimming and pressure volume tanks. At the end of the tank is the incompleted installation which will embrace an automatic mercury switch connected to an electric motor

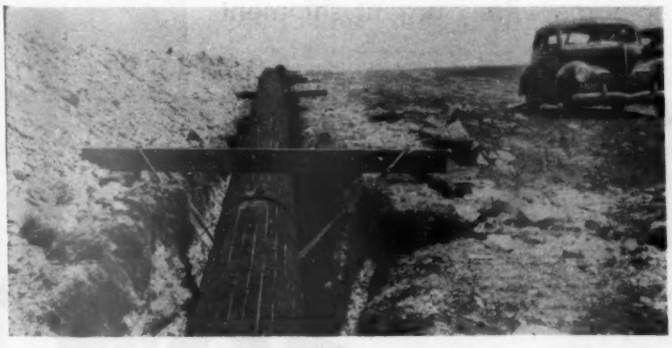
Left: Central filtering and water-storage plant. The erect tank is the combination skimming and filtering tank, while the horizontal one is the 10 by 40 ft. water-storage plant. The pump and motor is not used at present while the siphoning effect of the injection well is maintained

Pipe-Line Suggestions



Air Tanks Outside Crude-Oil Station

For reducing the possibility of serious damage in case of an air-tank explosion it is advantageous to remove air tanks from a pump-station building. Several types of installations have been used. One crude-oil pipe line now prescribes that air tanks be placed at a distance of more than 50 ft. from the station building and that they rest on a low concrete foundation of a type which can be constructed economically. This company also makes a point of identifying each air tank by a number stenciled on the end where it can be easily seen.



Method For Supporting Pipe in Ditch

In laying 400 miles of 26-in. loops for a natural-gas line, special provision has been made for supporting pipe in the ditch before the final lowering-in operation. In addition to having the pipe rest on skids at certain points, the pipe is suspended at other points by arrangement which consists of a belt, passing under the pipe, which is attached to yokes that fit in notches on top of the skid. These notches are cut in the skid so that the sling support is in the desired position. Pipe is protected with a coating of enamel, covered with kraft paper. Where the backfill contains rock or large clods, protection for the coating is provided by wrapping with wooden mats made of slats impregnated with asphalt and held together with wire.

Welder Made Dollies For Construction Work

In the foreground a nipple is supported on two dollies which have been made by a welder with little expense; these have been designed so they may be conveniently used for pipe-line construction at plants and terminals. A dolly of this type is made with a base which consists principally of a split piece of pipe cut in such a way that it is sufficiently broad and low to prevent its being readily overturned. Yet the base is arched enough to hold

the rollers at a height which permits them to rotate freely. The rollers consist of salvaged pulleys which are supported on pins. Steel strips welded across the bottom at each end prevent the dolly from sinking into soft ground. In the background is a jig or turntable made by a welder who utilized salvaged parts from the rear end of a truck. This is mounted on a light base fabricated out of used pipe; this can be easily moved about to points where it is needed. This device has proved useful in welding flanges.

Manifold For Gas Lines Crossing Water Line

A natural-gas system operating a line crossing a state highway north of Findlay, Ohio, was confronted with a problem presented by a proposed large water line which would cross the gas line, demanding changes in the gas line. Company engineers had to consider that the highway would eventually be widened. The foundation for the widened road would be too low to permit laying pipe of the diameter used in the gas line over the water line. The company wished to avoid relaying the gas line under the water line. A solution was found by cutting out a short section of the line and installing manifolds close to the place where the water line was to lie. These manifolds are connected by four lines of smaller-diameter pipe with mitered bends which would pass over the water line.

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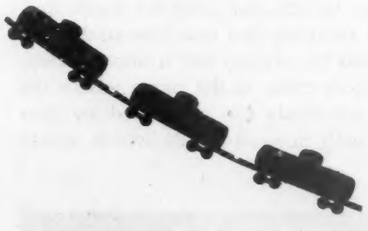

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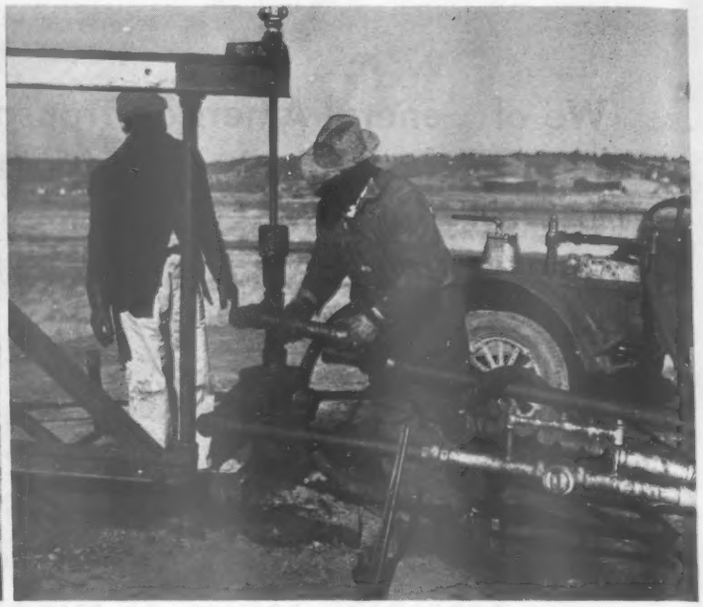


Left: Small trailer holds meter used for gaging production from wells in Glenn Pool repressuring project. Strainer at right will handle 10,000 cu. ft. of gas per day. The discharge from the relief valve is manifolded into the discharge from the meter. Right: Connecting meter for gaging production from wells at Glenn Pool requires only the breaking of the union on the flow line and connecting the half unions on the hoses. Small connections on 2-in. line in foregoing are for gaging gas production from wells

Small-Capacity Meters Used to Gage Well Productivity

By HARRY F. SIMONS

Line from sampler in meter comes through the floor of the trailer at the front and empties into graduate cylinder held in burette clamp on post. Lubricating oil can prevents dust being blown into the graduate

The field engineer is frequently balked in gathering fundamental information because there is no available economical method. The accompanying article describes how one engineer devised a practical and inexpensive means of obtaining production data on a repressure project. A small meter in a trailer does the job satisfactorily.

ONE of the problems confronting engineers on repressured properties and on depleted leases is the determination of the per-well output. This is so bad on some properties that the daily production is carried as a lease total rather than as per-well figure. In some cases this may be sufficient but where close check must be kept on gas, gas-air or water drive, or where wells are being evaluated critically, the daily production per well must be determined with reasonable accuracy.

Most old leases are equipped with a central tank battery into which the production from all wells is pumped. When the gathering systems were installed, it was thought unnecessary to run individual lines from the well heads to the tankage. In many instances the original layout might have included lines, but as the production declined these were replaced by a few main lines. While it is important to get a per-well gage, there are few cases in which the laying of individual lines for this purpose would be justified.

The first method tried by engineers was to use a small portable tank and a pump driven by an internal-combustion engine. This could be hooked to the well head, the daily production gaged and the oil then pumped out of the gaging tank to lease storage. The pump and tank were mounted on a small trailer which could be pulled by an ordinary passenger car.

A new method has recently been devised which simplifies the arrangement, reduces the time to make the test and gives a very satisfactory gage on the well's productivity. A small oil meter is used to measure the production from the well and the entire arrangement, meter, strainer, connections and hand tools, is carried in a small trailer which can be pulled around the field by hand if necessary.

Used on Repressure Project

The metering arrangement is being used on the repressuring project of the Sinclair Oil Co. at Glenn Pool and its designer is John Hemphill, engineer in charge of the project. At the present time there are 16 wells in the project, but only those in the repressured area have their production checked. By periodic checks of production it is possible to determine the effectiveness of the gas-air drive and the movement of the oil in the reservoir. Frequent checks are also made of the gas production of the wells to insure against channeling.

Gas accompanying or released from the oil being measured is often a complicating factor when metering oil, but in this case it gives no trouble as

(Continued on Page 70)

Subsurface Pressure Regulation

. . . of High-Pressure Condensate Wells

By JOHN O. FARMER
Field Engineer, Otis Pressure Control, Inc.

THE removable subsurface regulator consists of two principal parts: the locking-mandrel assembly and the regulating assembly. The locking-mandrel assembly is the same as that widely used for removable subsurface chokes and safety valves, and as it is used in more than 8,000 installations, most oil men are familiar with it. As shown in Fig. 1, it is a mandrel-and-slip type lock, which can be run into and removed from the well under pressure, on an ordinary steel measuring line. The sealing cups effectively seal off the annulus between the mandrel and the tubing.

The regulating assembly is also shown in Fig. 1, and includes a movable seat (15) which is forced down on the valve (17) by the regulating spring (14) compressed between the valve-seat guide (16) and an adjusting ring (13). Chevron packing (12) in the valve cage (11) prevents flow around the valve seat and directs it all through the bore. Valve (17) is mounted in a housing (19) and a small valve spring (18) is compressed between a valve housing plug (20) and a shoulder on the valve.

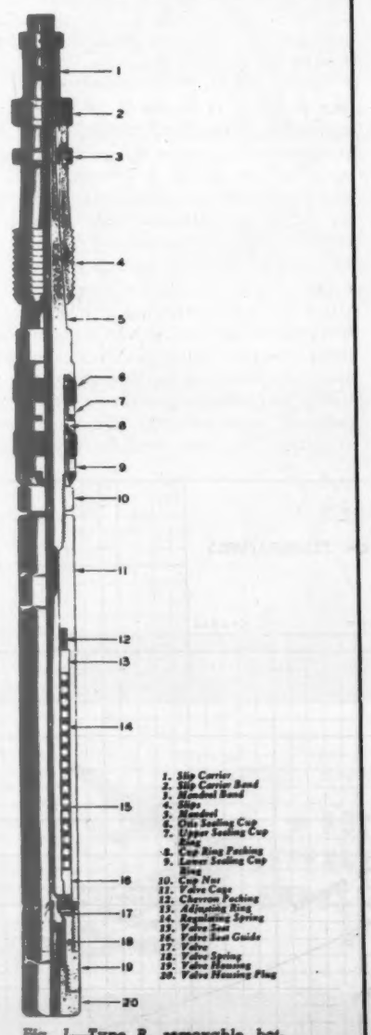


Fig. 1—Type B, removable bottom-hole regulator

A. P. I.

ABSTRACT

Discovery of deeper reservoirs under higher pressures has resulted in the need for control equipment to preserve and protect these great sources of energy; also, means of preventing freezing or the solidification of hydrates, caused by throttling or restricting production, are required. The development of a successful removable subsurface pressure regulator has enabled operators to reduce dangerously high flowing pressures at the surface to safe working limits. By transferring the principal point of pressure reduction from the surface to warmer subsurface levels, complete elimination of the freezing conditions in flow lines can be accomplished. Development and operation of a subsurface regulator are described, and charts and tables for use in determining proper depths for pressure reductions to prevent freezing are shown. Other beneficial results, heretofore considered subordinate, such as the reduction and stabilization of gas-liquid ratios in condensate-producing wells and the retardation of water encroachment, have been observed. The possibility of establishing conditions in the tubing string favorable to the precipitation of condensate through the use of subsurface regulators is suggested. Further technical research relating to the use of subsurface regulators for controlling temperatures and pressures in the flow string to obtain conditions most conducive to the precipitation and an increased recovery of condensate is desired.

Paper presented before spring meeting of the American Petroleum Institute, Southwestern district, Division of Production, Dallas, Tex., February 26-27, 1942.

Under ordinary producing conditions, valve (17) is held in its uppermost position by differential pressure and the small valve spring (18); the construction, however, permits the valve to move down to an open position when the pressure above the regulator is greater than the pressure below it. This feature permits downward pumping of fluid whenever it is necessary to kill the well.

The spring-loaded, "floating" or movable, tubular valve seat is the flow-controlling element. The design is such that the mechanical load imposed on the valve seat by the spring acting downward, tending to close the regulator, opposes the force of differential pressure across the regulator that tends to move the valve seat upward to an open position. Consequently, the position of the valve seat is determined by the predominant force. As the mechanical force can be controlled by imposing any desired load on the spring, a definite pressure reduction across the regulator can be obtained by adjusting the load on the spring accordingly.

If, for example, a flowing well has a tubing pressure at the surface of 2,500 lb. per sq. in., and it is desired to reduce the pressure to 1,000 lb. per sq. in., an adjusting ring is selected that will compress the regulating spring to impose a load on the valve seat equivalent to 1,500 lb. per sq. in. Consequently, a downstream pressure (above the regulator) of 1,000 lb. per sq. in. plus the pressure exerted by the spring will just balance an upstream pressure (below the regulator) of 2,500 lb. per sq. in. and the regulator will remain closed. When the surface choke is opened, however, the pressure above the regulator is diminished gradually to slightly less than 1,000 lb. per sq. in., and the regulator opens. This is caused by the increase in pressure differential across the regulator overcoming the downward force of the spring.

The degree to which the regulator valve opens depends upon the size of the surface choke used; the larger the choke, the greater the reduction in the downstream pressure; hence, the differential pressure across the regulator will be increased and the regulator valve will be opened wider. Conversely, selection of a smaller choke at the surface will cause the regulator valve to move to a position of less opening and restrict the flow. The operation of the regulator, therefore, is entirely automatic and variable rates of flow at substantially constant delivery pressures can be maintained by merely adjusting the surface choke. The daily delivery can be varied through a range of from zero to 9,000,000 cu. ft.; the maximum rate, however, is dependent upon the ability of the well to produce at the reduced flowing pressure.

To eliminate the terrific abuse caused by the abrasive action of flow under differential pressures exceeding 1,500 lb. per sq. in., it is the general practice to limit the pressure reduction across a single regulator to a maximum of 1,500 lb. per sq. in., and to use two or more regulators in series where greater pressure reduction is required. In multiple installations, the regulators are spaced at intervals of 500 to 1,000 ft., and are so adjusted that the total pressure drop is divided among them to give optimum service.

Theory of the Action of Subsurface Regulator in Averting the Formation of Hydrates

Hydrates found in the flow lines of gas wells and high-pressure condensate wells are white crystalline compounds of water and certain components of the gas that solidify under elevated pressures at temperatures above the freezing point of water. The formation of hydrates in the flow line downstream from a restriction is the result of an abrupt temperature drop caused by the refrigerating effect of a rapidly expanding natural gas that contains water. Although reduced pressure tends to vaporize liquid water in the gas and also to reduce the temperature at which the hydrates can exist as solids, the absorption of heat by the

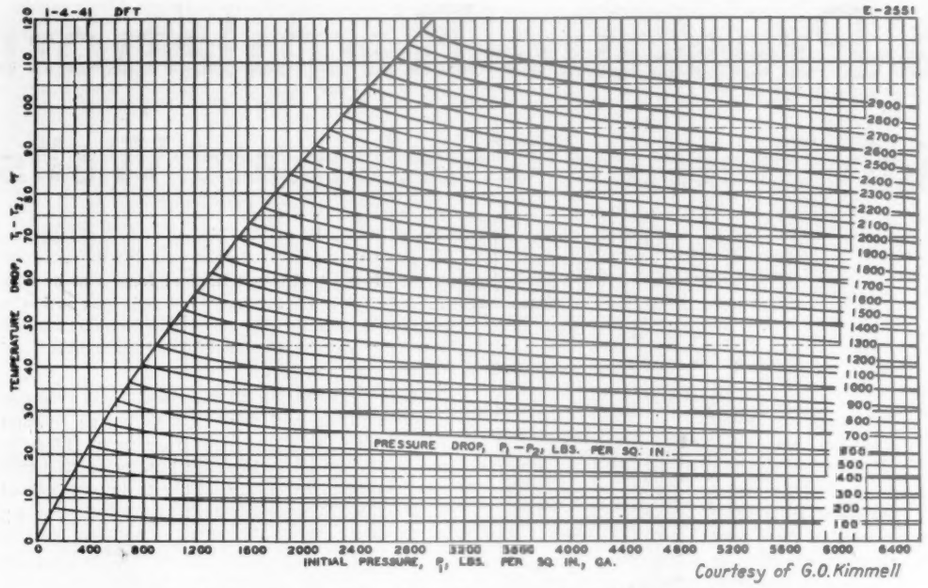

1-4-41 DFT
E-2551
TEMPERATURE DROP, $T_1 - T_2$, °F.
PRESSURE DROP, $P_1 - P_2$, LBS. PER SQ. IN.
INITIAL PRESSURE, P_1, LBS. PER SQ. IN., GA.
Courtesy of G.O.Kimmell

Fig. 2—Temperature effects of throttling gas produced from distillate wells

expanding gas more than offsets these tendencies and "freezeups" result.

Surface heaters, burning fuel, have the disadvantage of requiring attention in their operation and are a hazard where inflammable gases are concerned. Installing a regulator deep in the well obviates these difficulties and, moreover, utilizes the heat of the subsurface formations to compensate the temperature drop at no cost for fuel.

The only important problem involved in the use of the subsurface regulator to avert freezing is determining the minimum depth at which it can be set. As temperatures increase with depth, the solution lies in the selection of a depth at which the heat flow from the earth formation will be adequate to compensate the refrigeration effect of expansion through the regulator.

Sufficient data and formulas are now available whereby it is possible to determine whether freezing is likely to occur under certain conditions of pressure reduction (of a given gas) at given depths. The following data are required for making the computation:

1. Temperature gradient of well.
2. Gravity of the fluids in the flow stream.
3. Upstream and downstream flowing pressures at regulator.
4. Temperature loss through regulator.
5. Temperature and pressure conditions favorable for the formation of solidified hydrates.

The calculations are customarily made in the following steps:

1. Select the surface flowing pressure and the desired rates of flow.

This selection will, of course, be influenced by the line pressure of the gathering system.

2. Determine the upstream and the downstream flowing pressures at the depth at which the regulator is to be set.

The correction factors in Table 1 have been compiled for convenient use in determining the theoretical upstream and downstream pressures across the subsurface regulator before it has been set. The pressure on the upstream side of the regulator may be calculated by multiplying the actual surface flowing pressure (before the regulator is installed) at the desired rate of flow by a correction factor determined for the depth at which the regulator is to be set, and for the gravity of the gas. The downstream pressure immediately above the regulator may be found by multiplying the proposed or selected surface flowing pressure by the same correction factor.

3. The pressure reduction required at the regulator is calculated from the upstream and downstream flowing pressures determined in step 2.

Subtracting the downstream flowing pressure from the upstream flowing pressure will give the pressure reduction for which the regulator must be adjusted.

4. Determine, from the temperature gradient of the well, the upstream temperature of the flow stream at the depth at which the regulator is to be set.

5. Determine the resultant temperature drop at the regulator from the pressure reduction (step 3) and the upstream flowing pressure.

Fig. 2 contains the best data available on temperature loss due to pressure reduction. This curve has proved to be consistently correct and in close agreement with other observed data. Using the known values of temperature and pressure, it is possible, from this curve, to estimate the reduction in the temperature of the gas as it passes through the regulator.

6. Subtract the temperature reduction (estimated in step 5) from the upstream temperature of the flow stream (determined in step 4) to find the downstream temperature of the flow stream.

7. Determine, by referring to Fig. 3, the probability of hydrate formation and freezing.

Hammerschmidt's curve, Fig. 3, of hydrates formation temperatures, probably is the most widely used data for determining the temperatures and pressures favorable to the formation of hydrates in the solid state and the freezing of water condensate in flow lines. Using known determinants, it is possible to determine from the curve the probability of freezing, or the formation of solidified hydrates.

If freezing is indicated at a selected depth, either a lower depth with its corresponding higher temperature should be chosen to set the regulator or, if such is impossible or impracticable, the total pressure reduction should be divided between two or more regulators set in the well at intervals of from 500 to 1,000 ft. This spacing permits the earth's heat to raise the temperature of the flow stream between the points of pressure reduction, to compensate the heat loss incident to each succeeding reduction of pressure.

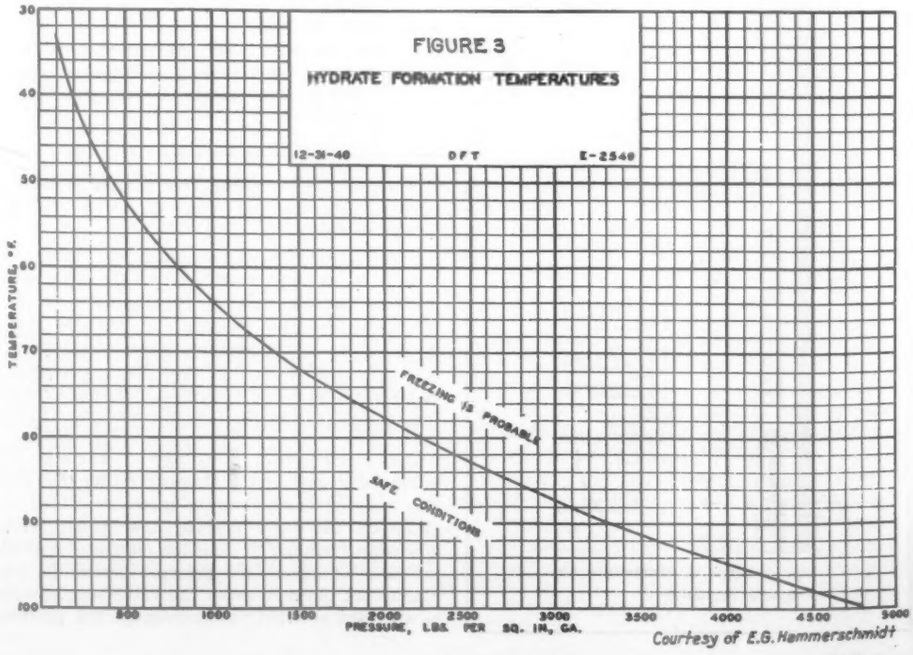
Important Considerations in Adjusting Regulator for Desired Flowing Pressure

The two most important factors to be considered in determining the adjustment of a regulator to give a selected surface flowing pressure are:

1. The maximum delivery rate at which the well is to be operated and the natural drop in flowing pressure at this rate of flow.

2. The change in weight of the column of the flow stream in the well above the regulator caused by the reduction in pressure.

The "pulldown," or natural reduction in flowing pressure of the well is directly dependent upon the productivity factor of the well and is particularly important where a wide range in the rates of production is contemplated. If a well has the capacity to produce at the maximum rate, as well as the minimum rate, without an appreciable change in the flowing pressure at the surface, the pressure change can be ignored. If, however, the drop in flowing pressure at the surface when the well is flowing at maximum rate is of the order of several hundred pounds per square inch, then the change is extremely important and must be considered in determining the proper delivery and flowing pressure at the surface. The pulldown pressure drop is neither absorbed nor diminished by the regulator installation; conse-



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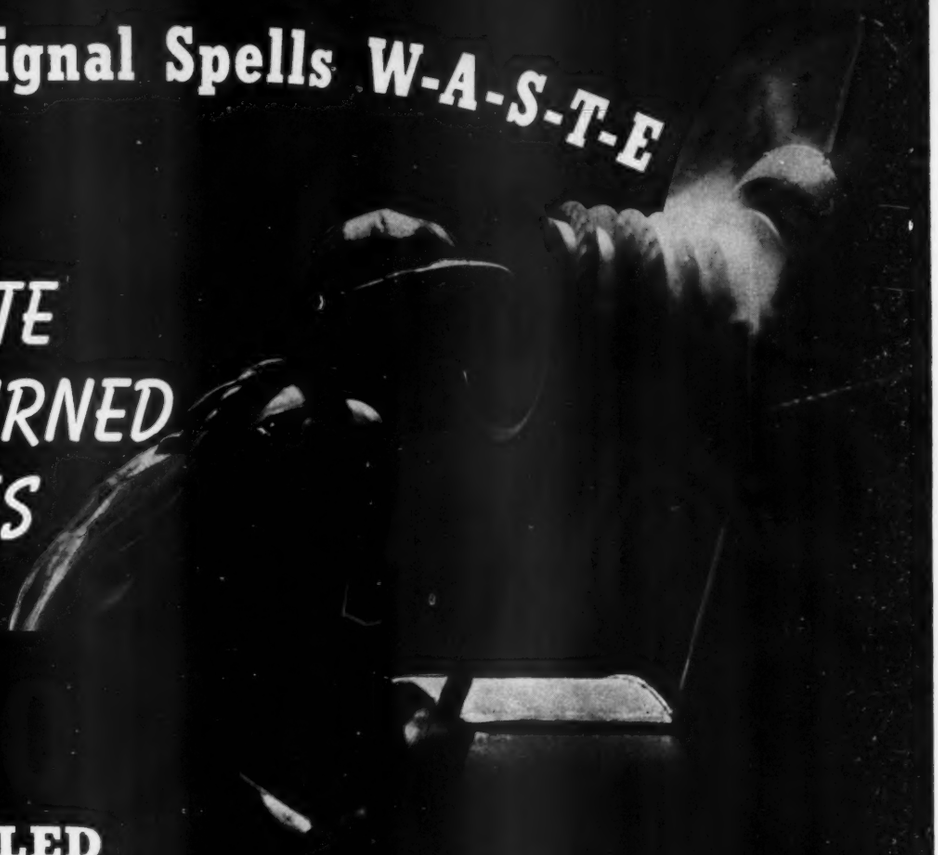

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quently, this pressure drop must be added to the pressure drop caused by the regulator, and cannot be ignored in adjusting the regulator to obtain the desired pressure reduction.

Assume the surface pressure of a well is 2,500 lb. per sq. in. when flowing at the rate of 1,000,000 cu. ft. of gas per day, and the surface pressure drops to 2,000 lb. per sq. in. when flowing at the rate of 3,000,000 cu. ft. of gas per day. If these pressures were lowered 1,500 lb. per sq. in. the resulting flowing pressures at the surface would be 1,000 and 500 lb. per sq. in. respectively. If, however, it is required to maintain a line pressure of 500 lb. per sq. in., or higher, on the gathering system, then a daily flowing rate of 3,000,000 cu. ft. of gas per day could not be reached because the flowing pressure at the surface would be below 500 lb. per sq. in. Therefore, in order to flow the well at this higher rate, it would be necessary to decrease the pressure reduction for which the regulator was to have been adjusted. If the pressure drop were reduced to approximately 1,200 lb. per sq. in., the flowing pressures at the surface would become 1,300 and 700 lb. per sq. in., respectively, and the maximum rate of flow could be obtained. These surface flowing pressures, although slightly higher than those selected originally, are high enough to cause flow into the gathering system, which is maintained at 500 lb. per sq. in., and still are low enough to prevent freezing at the surface choke. Therefore, in wells in which the flowing pressures at the surface have a tendency to pull down, it sometimes becomes necessary to sacrifice maximum pressure reduction in order to have high volumes of flow available.

The weight of the column above the regulator must be considered in order to determine the proper adjustment of the regulator for producing at the desired flowing pressure at the surface. This is necessary because it is a requisite in the determination of the flowing pressures on the upstream and downstream sides of the regulator; and, the force of these pressures, together with that of the regulating spring, actuate the regulator valve. As has already been explained, the pressures may be determined easily by reference to Table 1. Knowing the theoretical upstream and downstream pressures at the regulator, it is a simple task to subtract the downstream pressure from the upstream pressure to determine the pressure reduction for which the regulator should be adjusted. A calibration chart for the regulating spring is used to indicate the size of the adjusting ring required to give the pressure reduction desired.

TABLE 1—CORRECTION FACTORS FOR DETERMINING THE PRESSURE IMMEDIATELY ABOVE OR BELOW A BOTTOM-HOLE REGULATOR

Instructions.—To determine the theoretical upstream flowing pressure at the regulator before installation, multiply the actual surface flowing pressure (at the desired rate of withdrawal) by the correction factor indicated for the depth at which the regulator is to be set and for the gravity of the gas.

To determine the theoretical downstream flowing pressure at the regulator before installation, multiply the proposed surface flowing pressure by the correction factor indicated for the depth at which the regulator is to be set and for the gravity of the gas.

Well depth—	Correction factor— 0.6 gravity	0.7 gravity	0.8 gravity
1,000	1.021	1.025	1.029
1,500	1.032	1.037	1.043
2,000	1.043	1.050	1.057
2,500	1.054	1.063	1.071
3,000	1.0645	1.075	1.087
3,500	1.0705	1.089	1.102
4,000	1.085	1.100	1.116
4,500	1.099	1.116	1.132
5,000	1.110	1.130	1.149
5,500	1.120	1.141	1.163
6,000	1.132	1.155	1.181
6,500	1.143	1.175	1.195
7,000	1.155	1.184	1.211
7,500	1.171	1.195	1.227
8,000	1.181	1.210	1.241
8,500	1.190	1.230	1.260
9,000	1.202	1.240	1.273
9,500	1.215	1.250	1.285
10,000	1.225	1.265	1.305

To simplify this operation an average surface pressure of 2,200 lb. per sq. in. was used. Using Bureau of Mines Monograph 7 meant extending tables for both depth and pressure.

Results

In designing the subsurface regulator the primary objective was to provide for variable rates of flow under conditions that would eliminate freezing in flow lines and reduce dangerously high flowing pressures at the surface to safe working limits. The results, thus far, indicate that the objective has been satisfactorily and completely attained.

In many fields expensive and elaborate surface heaters have been entirely eliminated by the simple installation of one or more subsurface regulators. Surface flowing pressures ranging up to 5,000 lb. per sq. in. have been reduced to 1,500 lb. per sq. in. or less.

In the past, most of the subsurface regulator installations have not affected the condensate ratios materially, although in several places increased condensate recoveries have been observed. These increases may have been caused by the long distances between points of pressure reduction; that is, between the subsurface regulator and the surface choke, or between the surface choke and the separator; or by the combined effect of long distances between points of pressure reduction and the variations in temperature and pressure that existed between these points.

To the writer's knowledge, no subsurface regulator has been installed for the single purpose of increasing condensate recovery; consequently, the effect on the condensate ratios were obtained accidentally and were not predetermined. It may be possible, however, through the use of one or more subsurface regulators, to establish conditions of temperature and pressure in the tubing that are conducive to precipitation or "dropping out" of condensate and thereby effect a greater recovery of condensate.

The gas-liquid ratios have been stabilized in virtually all wells equipped with subsurface regulators. This stabilization may have resulted from the maintenance of relatively constant bottom-hole pressure, which could not be reduced below the pressure for which the regulator was adjusted. For example, if the subsurface regulator was adjusted for a pressure differential of 500 lb. per sq. in., the regulator could not be opened until pressure on the upstream side of the regulator was 500 lb. per sq. in. or more, and so long as this adjustment was maintained the fluid pressure in the well, below the regulator, would not be decreased below 500 lb. per sq. in.

Acknowledgments

The writer extends thanks to E. G. Hammerschmidt for permission to use his curve entitled "Hydrate Formation Temperatures" (Fig. 3), and G. O. Kimmell for permission to use his data on "The Temperature Effects of Throttling Gas Produced From Distillate Wells" (Fig. 2).

Small-Capacity Meters Used to Gage Well Productivity

(Continued from Page 62)

the wells are produced under varying amounts of vacuum. The gas cannot come out of the oil as the pressure on it is increased when it is brought to atmospheric pressure. The accuracy of the meter was checked before putting it into service by producing oil into a tank and gaging it; the meter is checked occasionally to insure against an inaccurate gage.

The meter used is a small positive-displacement type crude-oil meter which consists of two pistons traveling back and forth. The pistons are alternately filled and emptied and are connected to a counter so that the total amount of oil moving through the meter in any length of time is recorded. It is merely a piston pump operating in reverse.

The meter used at Glenn Pool records in barrels and will accurately measure at rates from 0.01 to 0.18 bbl. per minute. The dial records up to 10,000 bbl. and reads to hundredths of a barrel. Gaging in a stock tank is generally carried only to half barrels so the metering is much more accurate. The meter is designed to operate up to 125 lb. per sq. in. pressure.

Gaging of production from a well is not complete unless some provision is made for obtaining a sample to determine the per cent of water contained in the oil. The meter also includes a small sampler which is merely a piston with a small hole in it which moves in and out of the metering chamber. The sampler is designed to deliver 8 cc. per bbl. measured by the meter. Normally, the sample is caught directly under the meter, but for convenience a small copper tube is run through the floor at the front of the trailer and into a graduate cylinder held in a burette clamp attached to a short post.

Strainer Removes Debris

A small strainer ahead of the meter removes any debris (valve cups, etc.) from the oil. It is also equipped with a float which separates any gas from the oil and prevents its entry into the meter. This strainer will handle approximately 10,000 cu. ft. of gas in 24 hours. Where oil containing considerable gas is being metered, a much larger strainer is required, but the major use for the gas separator at Glenn Pool is when the lines from the well are being purged.

The meter is also equipped with small bleeders to remove air from the system while it is being put in operation. A pressure-relief valve set to operate at 125 lb. per sq. in. pressure prevents any damage from line stoppage or excessive pressure from any cause. Small holes, with plugs, in the body of the meter allow the measuring pistons to be moved with a small rod in case they hang up for any reason.

The meter assembly and strainer are mounted on a frame made from 4-in. angle irons which are in turn bolted to the trailer frame. It can be easily removed.

The meter is connected to the well by simply breaking the flow line at the union located at the well head and connecting the intake and discharge hoses there. The hose ends are equipped with half unions which match those on the flow lines. This operation can be performed in a few minutes. In some cases it was necessary to reverse the unions installed on the flow lines so that the same half of the union would always be on the intake and its mating half would always be on the discharge side. This was the only change necessary and it was made to prevent switching union halves on the hose at the different wells.

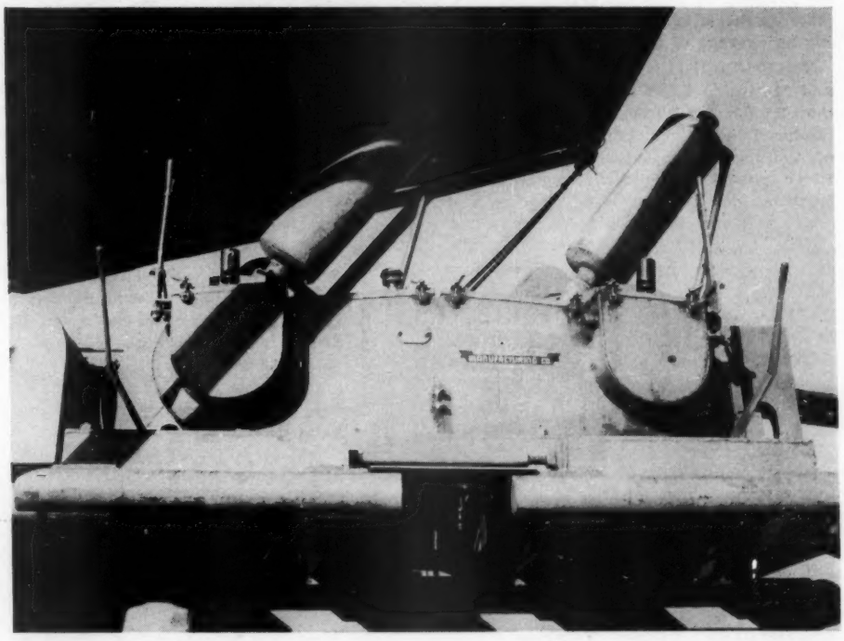
The hose and all connections on the meter are of 1½-in. diameter with the exception of the half unions on the well end of the hose which are 2 in. The hose is purposely not clamped on to the steel connections, so that it acts as a safety valve and would blow off before excessive pressure was put on the meter.

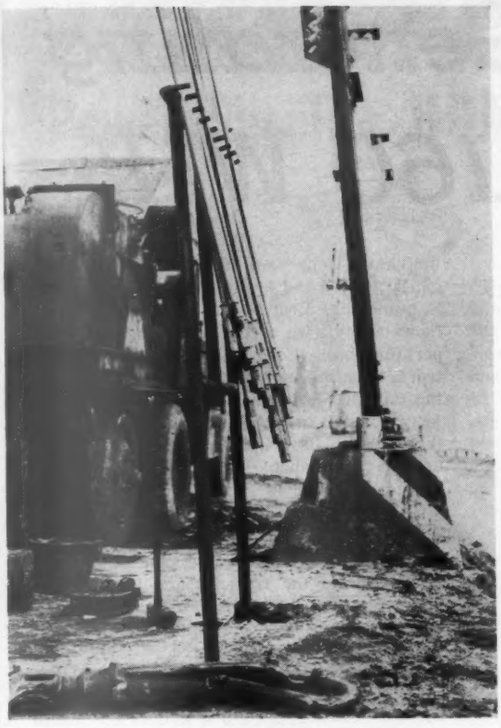
Wells being tested pump off in from 2 to 20 hours and the meter is left hooked up at each well long enough to obtain one day's production. After hooking the meter to the well, the engineer can drive off and leave the trailer as a special stand is provided on the trailer hitch for that purpose.

Operating Ideas

Keeping Mufflers Under the Roof

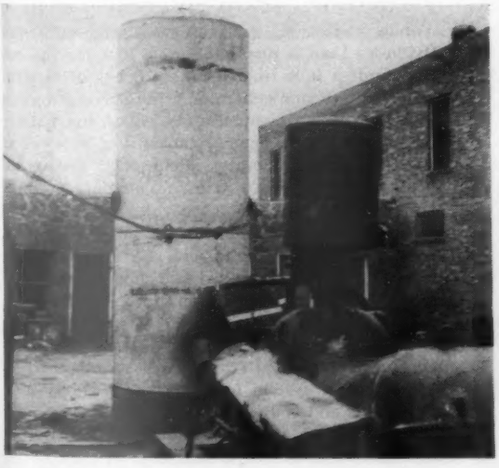
On many rigs the covering for the drilling engines is so low that it sometimes is necessary for the engine mufflers to protrude through the roof. An operator in West Texas has eliminated this necessity by devising a means for adjusting the height of the mufflers to conform with the height of the roof. Each of the mufflers is equipped with an adjustable supporting arm, fabricated from a section of small pipe. Turning the muffler at the connecting "T" nipple on the engine-exhaust line, the angle of the muffler can be adjusted to permit the muffler to go under the roof. The hinged supporting arm, fastened in place, holds the muffler.





Device Holds Sucker Rods

A well-servicing crew in the Huntington Beach field uses the device pictured in the accompanying photograph to hold sucker rods out of the way during operations. The device is built of old 2-in. pipe with 1-in. rods on the top crossbar to serve as fingers. The entire frame is carried on the pulling truck, and each derrick floor is provided with properly spaced 3-in. pipes set in the concrete so that the legs of the frame can be inserted upon the arrival of the servicing truck.



Separator Used For Muffler

The regular mufflers used on the engines of a diesel electric rig were considered inadequate for townsite drilling in one Texas field. The drilling contractor took an old oil-gas separator and connected the engine exhaust into what is normally the oil-discharge line. The openings ordinarily used for the entrance of the oil-gas mixture into the separator were left open for the escape of the exhaust gases into the atmosphere.

Oil Well Pumps Water Well

When starting an oil test an operator sometimes will drill a water well from the same derrick floor to be used in drilling the oil test, skidding the rotary over a few feet for this purpose. When the well is on the pump, some means must be provided for pumping the water well if the water still is to be used. Instead of installing a separate gas engine or motor-driven water pump or jetting the well, an operator in the Schuler field, Arkansas, pumps such a well with the same pumping rig used on the oil well. This is done by a simple beam extension spacing the rods of the two wells. A chain or cable from the end of the main pumping beam to the water-well end of the spacing beam lifts the water-well rods in unison with the oil well.

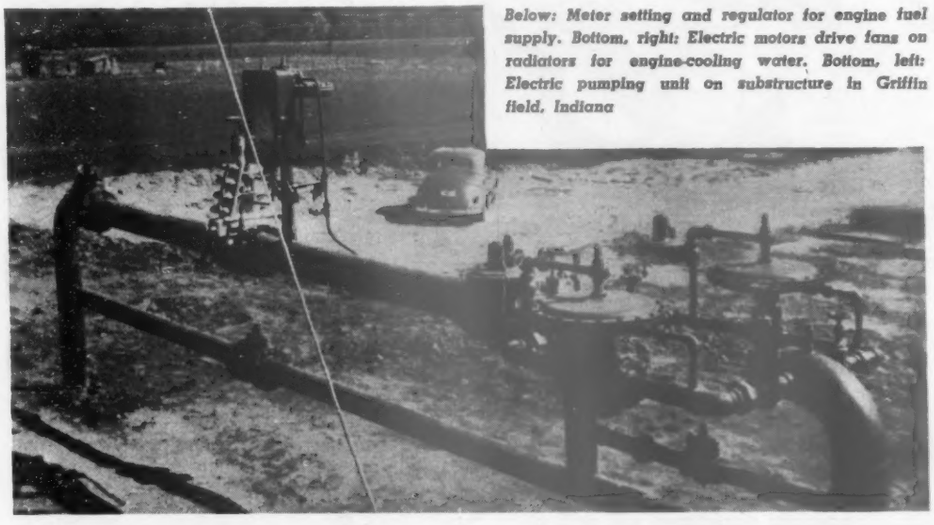
Central Electrical Generating Plant Designed for 160 Wells

By HERNDON E. DAVID

AN electric-generating plant with distribution system has been recently put in operation by Continental Oil Co. in the Griffin field of Gibson and Posey counties, Indiana, and in less than 3 months, results have indicated the economies to be obtained by pumping wells with electrically driven equipment. The plant is at present used for pumping 84 wells and is designed for the ultimate operation of 160 wells. Each well is producing an average of 50 bbl. daily.

The Griffin field is located in Townships 3s-13w and 3s-14w, and has a productive area of more than 3,200 acres. The majority of the field's oil is produced in Indiana, but a considerable amount of the production extends across the Wabash River into Illinois. Discovery well was drilled by Fitzpatrick & Hays on the Cooper estate, SE NW NE 13-3s-14w. It came in on December 16, 1938, flowing 604 bbl. of oil in 24 hours from the McClosky lime. The major development of the field was completed by the end of 1940 but considerable work is still under way in the field and excellent producers are still being completed. At the present time the field has 290 producing wells and 44 dry holes. Total production from the field is 20,000 bbl. daily with the bulk of the production owned by Continental Oil Co., Hall-Edwards and Joe Bander. Practically all of the wells have been pumped with gas engines, the Continental wells being the first to undergo large-scale conversion to electrically driven units.

Production in the Griffin field is obtained from the Waltersburg, Tar Springs, Bethel, and Aux Vases sands, and the McClosky lime. Loads on the individual wells vary from 3 to 10 hp., depending largely on the formation from which the well is producing. Most of the wells are pumped 24 hours a day with a very few being pumped on a part-time basis. Each well in the Continental system is equipped with an individually geared pumping unit driven by an electric motor. On the majority of the wells these motors are 440 volt, three phase, 10-12 hp., 60 cycle, 1,200 r.p.m., induction-type capable of running continuously with not over a 40° temperature rise.



Below: Meter setting and regulator for engine fuel supply. Bottom, right: Electric motors drive fans on radiators for engine-cooling water. Bottom, left: Electric pumping unit on substructure in Griffin field, Indiana

The generating plant is located in the south central part of the area supplied by the system. Although a centrally located plant would reduce the length of the transmission lines, the entire system is in the high-water area of the Wabash River and the plant was located so that it would be out of the high-water area so far as possible and still be convenient to the system. The wells supplied by the plant are in the high-water area and the pumping units and motors are placed on substructures above the high-water level.

The generators and internal-combustion engines are set on a concrete foundation and housed by a steel frame and sheet-metal building. The radiators used for cooling the engines and vertical scrubbers for the incoming fuel gas are located outside the building. Switchboards and controls for distributing the current are located inside the building.

Three 6-cylinder, 4-cycle, internal-combustion engines are used in the generating plant. These engines have a rating of 400 hp. at 450 r.p.m. and burn natural gas as a fuel. Several gas traps are maintained on leases in the field and the gas obtained is burned in the engines without treatment. A few of these gas traps, however, have been abandoned because the sour gas produced by the McClosky lime is unsuitable as a fuel for the engines unless it is treated. The engines drive generators direct, one generator being driven by each engine. These three-phase, 60-cycle, alternating-current generators have a capacity of 273 kw. at 450 r.p.m. Each generator is equipped with a cubical-type switchboard with a voltage regulator.

A primary circuit of 2,300 volts is maintained and this is stepped down to 440 volts in the secondary circuit on the leases. The entire system consists of 30 circuit miles of primary conductor and 15 miles of distribution line. Standardized, 315-kva. transformers are used to step down the voltage from the primary to the secondary. Each transformer supplies from 6 to 10 wells.

The cooling system for the engines consists of three units and is an entirely closed system. Each unit is made up of a large radiator cooled by 93-in. diameter fans. The fans are driven by 15-hp. electric motors and operate at a speed of 375 r.p.m. Each radiator has a heat dissipation of 4,200 B.t.u. per hour.

From the past history of Griffin and other Illinois and Indiana fields, the period of peak oil production is reached quickly, holds steady for a period, and then declines gradually. With the present installation 160 wells can be handled at their present rate of production. As the volume of fluid to be handled drops, more leases and wells may be added or the size of the plant reduced by removing one of the units to a new location where it can be utilized.

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Blackout Technique Devised By Gulf Coast Plants

By NEIL WILLIAMS

A series of experiments was conducted recently in a large refinery and a gasoline plant on the Gulf Coast to determine the most effective procedure to be followed to blackout such plants during possible air raids and still continue safe operation. The owners, the Texas Mid-Continent Oil and Gas Association, Office of Civilian Defense and the U. S. Army cooperated in the tests. Conclusions reached are summarized in this article.

OWNERS and managers of refineries, gasoline plants, recycling plants, pipe-line stations and other vital points in the petroleum industry are now concerned with protecting their property against damage from enemy aircraft. Possibilities of an invasion of this country are not great at the present time but if satisfactory protection is to be provided, considerable study and planning are necessary before such an emergency arises.

Recently a series of tests and experiments with blackout techniques was carried out in a Gulf Coast gasoline plant and in a refinery. The work was done by several oil companies in conjunction with the Texas Mid-Continent Oil and Gas Association, the Office of Civilian Defense and the U. S. Army. The interior lighting of buildings, hand lamps, motor lighting, the effect of boiler fires, position and types of gages were evaluated and tested to determine what should be done; some camouflage experiments were also carried out but are not yet concluded. The basic facts learned from the experiment were then made available to oil companies operating in the Gulf Coast territory. The accompanying article is a summarization of the work.

Blue lights (10-watt) were substituted for the regular lights in three buildings. These bulbs were of the standard natural-blue type commonly sold by electrical supply houses. In one building, a 10-watt natural-blue bulb was used for each 440 ft. of floor space and this arrangement gave ample light for movement through the building without danger. No instrument readings could be made but repairs were possible by a man familiar with the job using a small hand lamp.

Aluminum Piping Conspicuous

From the outside at a distance of 100 ft., the windows in the building could not be distinguished but the aluminum piping reflected some light and was covered. It was seen that all aluminum and white objects reflected light and should be painted a dark, nonglossy color. The engineer's aluminum safety hat could be seen. Caution should be observed in locating lights so that the source of light cannot be seen from outside the building as even a small light can be seen for considerable distance.

Blue lights were selected for blackout purposes for a number of reasons—the relative insensitivity of the human eye to this color, high frequency and short-wave length of blue light cause rapid diffusion so that it cannot be seen for any great distance, and because the blue glass used on the light is rather opaque and it lets only about 15 per cent of the light through. Also, blue lights have no detrimental effects on the eyes of the workmen.

Red and yellow lights do have a detrimental effect and can also be seen for a greater distance because of their longer wave length.

Through the use of blue lights, the plant operator is relieved of shutting down during a blackout or operating in a sealed building with windows closed and painted black or boarded up. Closing refinery or gasoline-plant buildings up tightly would be dangerous because of the possible accumulation of gases. Buildings can be equipped with lightproof louvers for ventilation but the cost is comparatively high as some means of forcing a draft would also have to be provided.

For certain types of work, the 10-watt blue lamps are unsatisfactory as an employe doing machine-tool work, gage reading, etc., cannot perform his duties. In such cases, rooms should be well lighted and arrangements provided for trapping the light so that it cannot be seen from the outside. For most oil-field operations, bright lighting is not absolutely necessary and some plants have been operated in total darkness for considerable periods.

Interior painting which is white, aluminum or glossy will reflect the spots of the lamp filaments and may be seen from some distance. A dull paint is recommended. As there is practically no light outside the buildings all fire hydrants and other obstructions should be guarded or removed.

The amount of light obtained through the use of 10-watt natural-blue bulbs was the minimum which would still permit easy movement around the machinery. An attempt to measure the amount of light with a light-meter reading as low as 0.02 c.p. gave no reading. It was found that the additional illumination obtained by increasing the size of the bulbs was not sufficient to warrant the change in view of the increased distance from which the light could be seen.

Hand Lamps

Tests made with safety flashlights indicated that a dark-blue plain glass 7/64-in. thick was the best diffuser. It was also necessary to solder a small metal plate to the bulb retaining wire to prevent the red glow of the filament from being visible. A hood made of tin, 8 in. long, made the beam from the flashlight less visible.

Different types of reflectors were tried—polished, white and black, the latter giving a minimum of light. With a two-cell flashlight and a black reflector, the light had to beld within 2 in. of the object viewed. Some men might not be able to see by this light and possibly a three-cell flashlight with a black reflector or a two-cell light with a white reflector may have to be used. An unpolished reflector with the hood gives a good light but can be seen from some distance. Whenever the light source is in view, it can be seen from three-tenths of a mile.

A gravity switch (mercury) built into the flashlights allows them to operate while held level or pointed downward but will not permit the beam to be elevated.

Liquid-Level Gages

Gages of the high-pressure type present a problem, particularly where a clear fluid is being handled. Inaccessible glasses should be fixed so they are easily reached. Cooling-tower and tank levels should be equipped with indicating floats. Gage glasses with glass on two sides are suggested as the light source can be held behind the gage and the fluid level determined.

Boiler-gage glasses present another problem as they are above the operator's head. Two methods can be used to light such gages. One is to place a 15-watt blue fluorescent bulb in a metal-plate fixture mounted at the side of the gage. A 1/32-in. slit the length of the glass provides enough light to see the gage. This will allow a glass of the red-line type to be read easily although all objects in the lighted area must be painted dark to cut down reflections.

A side glow of lucite plastic light can also be used to illuminate gages. A clear gage glass must be used and the lucite strip placed behind and parallel and ¼ in. from it. The end of the lucite strip should be blacked out so only the side glow is used.

Meter Lighting

Satisfactory meter lighting was obtained by painting the meter-door glass black with the exception of a slot ⅝ in. wide and as long as a pen sweep. A lucite lamp was placed inside parallel to the slot but not in direct view. The end of the lucite was blacked out and only the side glow used. There was adequate light to read the chart and it was not visible at a distance greater than 50 ft.

Hoods can be used for shielding boiler fires. These can be made of corrugated sheet iron about 10 ft. in length. An 8-in. space at the bottom will allow burners to receive air. Painting the floors and walls of the boiler room black will prevent light reflection and a baffle in the hood will also help.

Miscellaneous Suggestions

Pressure gages with raised figures can be used to advantage as readings can be made by touch instead of visually. Liquid levels or similar conditions that might become dangerous should be equipped with audible alarms. Valve wheels should be nicked or marked so the position can be determined by feeling. Obstructions should be removed from the yard and special provisions made to prevent men from stumbling over objects. Blue ink on meter charts cannot be seen with a blue flashlight. White chat and shell reflect light, and will have to be colored. Red-column thermometers are more easily read with the blue flashlight than mercury columns. Cooling-tower vapors and steam are not easily seen unless the observer is fairly close.

A test of the plant blacked out in the above manner showed that planes flying as low as 500 ft. could not see any lights although the outline

(Continued on Page 80)

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of the buildings could be distinguished. Applications of normal daytime camouflage paint will be used to correct this so that at least partial obscuration of the buildings will be obtained.

Smoke and steam are an indication of industrial activity and can also be used by aviators as a wind gage to correct the bomb sights. Both should be kept at a minimum.

Flares at plants are the most conspicuous markers available to aviators and should come in for a dousing at the first alarm. This brings up the problem of gas collecting in depressions and causing explosions with some discounting the danger and others contending it a definite hazard. Where the gases are light, the danger is less than with heavy gases. Weather and wind conditions also affect the problem.

Communication systems and alarms in case of attack are also vital with several suggested courses being open. One is to equip all plants with radio sets so they can hear any alarms. Another is to organize a call system with supervisors and their families doing the work. Companies having their own communication systems can have a circuit installed which will sound an alarm at every station or plant simultaneously. The message can be delivered to all superintendents and responsible parties at once.

The danger from saboteurs during an actual or practice blackout is actually more dangerous than the danger from bombs according to many oil men. Special precautions are being taken by plant operators to prevent sabotage or pilfering. Manproof fences and guard systems will protect central installations with patrols being organized to protect outlying units and lines. The oil companies favor organizing their own guard systems rather than turning over detailed plans of their operations to some civilian authority and then depending on it for protection. Reason behind this is the belief that the fewer who know exactly where the vital points in the system are located, the less the danger from sabotage. Where definite authority for protection of an area has been established, or where the armed forces are in charge, close cooperation will be willingly rendered. Objection raised by oil men is to the giving of detailed information to some minor political official about whom little is known and whose authority is questionable.

The importance of having a definite plan to follow during blackout and other emergencies was also stressed. Occasional drills to make sure the men are on their toes and know their positions and can perform their respective functions will reduce the danger when the emergency arises.

Refining Methods Available For Wartime Demands

By J. F. THORNTON and W. C. DICKERMAN, JR.
The Lummus Co.

YEARS of costly research and development by the petroleum industry have made possible its production of high-quality fuels and lubricants, toluene, and stocks for producing synthetic rubber. This is one of the greatest assets of the nation in meeting wartime demands. There is also an amazing variety of processing methods available for the manufacture of additional vital products.

The most satisfactory 100-octane fuel is a blend of 15-20 per cent of isopentane, selected aviation base stock and enough high-octane blending agents, such as alkylate, so that the blend will lead to 100-octane with the specified maximum quantity of Ethyl fluid. The blend must also meet certain vapor pressure, distillation, and other specifications.

Isopentane, used because of its convenient vapor pressure, high-octane number, and good lead response, is usually obtained from natural or straightrun gasoline by close fractionation. A large percentage may also be found in the gasoline from certain catalytic cracking units. And it is present in thermally cracked gasoline from which it can be recovered. The available supply is adequate although additional facilities may be necessary to achieve maximum recovery.

Base stock must be of good octane rating and high lead response and, due to extreme storage conditions to which aviation gasoline is subjected, straightrun stock and certain catalytically cracked produced gasolines are preferred because of oxidation stability and low gum-forming characteristics. The supply of naturally occurring base stock is limited. One alternative method is precise fractionation of low-octane straightrun gasoline, i.e., separation by boiling point of narrow-range high-octane cuts containing chiefly isoparaffins which are blended to yield a superior base stock. This is already a commercial reality and the equipment is simple. Special catalytically produced gasoline is also an exceptionally good base stock. A recently announced development for improvement of base stock is catalytic naphtha isomerization.

Desulfurization of base stocks to improve lead susceptibility often increases aviation-gasoline production. In one instance reducing the sulfur content from 0.057 per cent to 0.013 per cent indicated an increase of 32 per cent in 100-octane gasoline production due to improved lead susceptibility and in another, reducing the sulfur from 0.009 per cent to 0.0009 per cent indicated an increase of 10 per cent in production. This indicates the economic advantage of proper preparation of base stocks.

A.I.M.E. ABSTRACT

The high-octane blending agent is the most important component of 100-octane gasoline and catalytic alkylation is the most widespread process used to obtain it. Alkylation is commonly interpreted to mean the catalytic junction of an isoparaffin with an olefin hydrocarbon. Sulfuric acid is the most widely used catalyst but another is now being used commercially and has important advantages. Isobutane is the most commonly used isoparaffin and, while numerous olefins will alkylate, butylenes are preferred since isobutane and butylene give the highest octane-number product and consume the least catalyst.

Isobutane is commercially recovered in natural-gasoline plants and fractionated from straightrun gasoline and is found in almost all cracking-plant streams. Formerly a waste product, all available isobutane must now be recovered and converted. This means that present gas-field and refinery equipment should be redesigned for greater recovery, especially the former. When this supply proves inadequate, already-operating isomerization processes can convert normal butane into isobutane and additional quantities are available from catalytic cracking units.

Recently special units have been installed to produce the four butylene isomers which are highly reactive chemically though they were formerly only available as a side product of cracking. Demand may eventually exceed the present supply of olefins and while polyform, gas-reversion and other processes can produce butylene from naphtha and butane, units designed especially for the dehydrogenation of normal butane into butylenes may be required. This will undoubtedly be done catalytically to suppress undesirable reactions that reduce yields. Increased use of butane and butylenes for producing alkylate and butadiene will reduce quantities for sale as bottled gas for use in motor gasoline and propane may have to be used to meet motor-gasoline vapor requirements.

Extreme-Service Lubes

Quantity production of extreme-service lubes for airplane-engine-powered tanks and diesel-powered craft is another problem. No technological problem is involved since the processes are already available. However, careful consideration is being given to the maximum utilization of the many existing plants by selection of charging stocks. Expansion of capacity to supply this demand and also to maintain present motor-oil quality in order to supply military trucks, etc., amply and easily would require little material and no technical problems.

Virtually unlimited quantities of toluene are available from petroleum. The average United States crude contains little toluene and its isolation from crude sources is therefore restricted. Special catalytic reforming of naphthas produces a high toluene content product and most thermal reforming operations also yield a gasoline relatively high in toluene. However, its removal from high-octane aromatic-type gasoline slightly reduces the octane of the motor fuel and in some cases, it is preferable to operate toluene producing units exclusively.

Purification of toluene involves concentrating it in a narrow boiling fraction which is then subject to a special distillation process to remove the aromatic compounds. A simple finishing treatment makes it satisfactory for nitration purposes. Other schemes for isolating toluene are used but the units are relatively simple and the equipment is standard and could be salvaged. Likewise synthetic toluene-producing processes could readily be revamped for motor fuel production.

Since the engineering economics of petroleum refining processes must be viewed in the light of present emergency demands, the engineering of refinery projects is being carried out so as to minimize demands on engineering facilities and material suppliers. Due consideration must be given to the use of available design and, in the ideal instance, new plants should duplicate already designed plants to save time. Use of alloys should not be considered in the usual light of long-term replacement payout. In certain instances it may be advisable to incorporate into units with large heat loads facilities for waste heat steam generation. Special trimmings are being eliminated, steel structures reduced, readily available propane can be considered as a refrigerant and absorption type refrigeration units may be used if compressor deliveries are delayed. These are some of the ideas under consideration to relieve refinery construction demands on other industries.

Influence of Testing Conditions On Rupture Strength

By C. L. CLARK
Timken Roller Bearing Co.

PART 5 IN A SERIES

THE majority of stress-rupture tests conducted to date have been on standard 0.505-in. diameter specimens, with the temperature and stress being maintained continuously until fracture results. In cracking-still-tube service the heating and stressing is intermittent, since the coke is removed from the tubes at periodic intervals, and consequently this raises a question as to the effect of these intermittent conditions on the rupture characteristics. Likewise both the tube diameter as well as the wall thickness varies in different applications and the effect of specimen size is thus of importance.

Influence of Intermittent Heating and Loading

In order to determine the influence of this factor on the strength, intermittent rupture tests were conducted at 1,200° F. on 5 Cr Mo and Sicromo 5S steels with the stress and temperature being removed at 30-day intervals. This time period was chosen as it is representative of the operating cycle employed in many refineries. These particular steels were used since 5 Cr Mo shows a break at 1,200° F. in its logarithmic relationship between stress and fracture time while Sicromo 5S does not.

The results obtained from these tests are shown in Fig. 1. The additional continuous test conducted on Sicromo 5S, under a stress of 5,200 lb., required 2,550 hours for fracture and this point fell exactly on the line established by the previous tests. The intermittent tests, under stresses of 5,200 and 4,500 lb., produced fracture in somewhat shorter time periods than indicated by the original relationship. On the basis of stress, the decrease in strength, due to the intermittent heating and loading conditions, is of the order of 10 per cent at 5,000 hours but the trend of the results indicates this difference would be even smaller under more prolonged time periods.

A different heat of 5 Cr Mo steel was used than in the original tests and, as shown in Fig. 1, the continuous rupture strength of this new heat was about 12 per cent lower. Intermittent tests on this heat yield strength characteristics inferior to those of the continuous tests by 5 per cent.

The results from both steels indicate the rupture strength to be decreased by the intermittent loading and heating conditions but the degree is of a small order of magnitude and comparable to that which may be expected to exist between different heats of the same analysis. Neither did the intermittent conditions influence the ductility to rupture or the type fracture obtained.

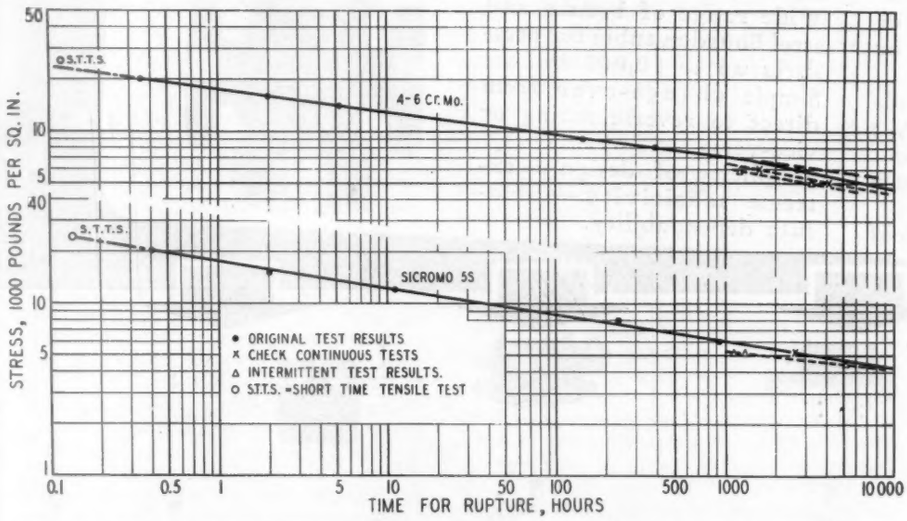


FIG. 1. INFLUENCE OF INTERMITTENT HEATING AND LOADING ON THE 1200° F. RUPTURE STRENGTH OF TIMKEN SICROMO 5S AND 4-6 Cr Mo. STEELS.

Influence of Specimen Size

The effect of specimen size on the rupture strength of 5 Cr Mo steel at 1,300° and 1,500° F is shown in Fig. 2. At both temperatures an increase in the specimen size from 0.505 to 1.0-in. diameter has raised the rupture strength with the degree of increase being the more pronounced at 1,500° F.

The break in the logarimithic relationship of 5 Cr Mo at 1,300° and 1,500° F. is due to lack of sufficient oxidation resistance and, on the basis of the 1,500° F. results, it is apparent that the increased specimen size shifts this break to longer time periods. This is as should be expected as the amount of exposed surface, per unit of mass, is less the larger the diameter of the specimen. This is substantiated by the fact that when the break does occur in the logarithmic relationship of the larger specimens, the slope of the line is about parallel to that of the smaller specimens. It also accounts for specimen size having a greater influence at 1,500° F. than at 1,300° F.

While no experimental evidence is as yet available it is expected that specimen size will be without influence for those steels which do not exhibit a break in their logarithmic relationship between stress and fracture time and also for those steels in which the presence of a break is not due to lack of surface stability.

In addition to the two factors discussed above, the atmosphere maintained during the tests will likewise have an influence on the rupture strength but it is expected that different steels will in general retain their same relative order of merit. This is especially true in steels for cracking-still service since most of the rupture tests to date have been conducted under oxidizing conditions and the same elements which improve resistance to scaling also improve the resistance to the attack of hot petroleum products.

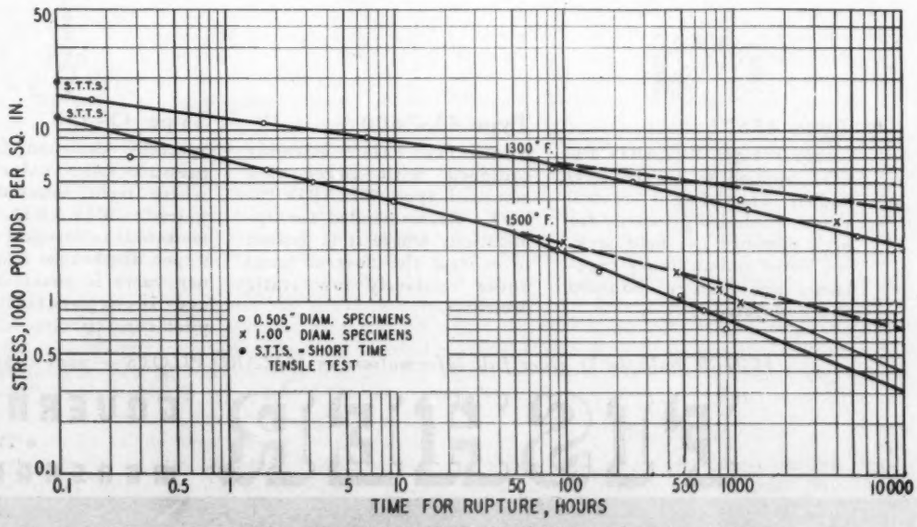
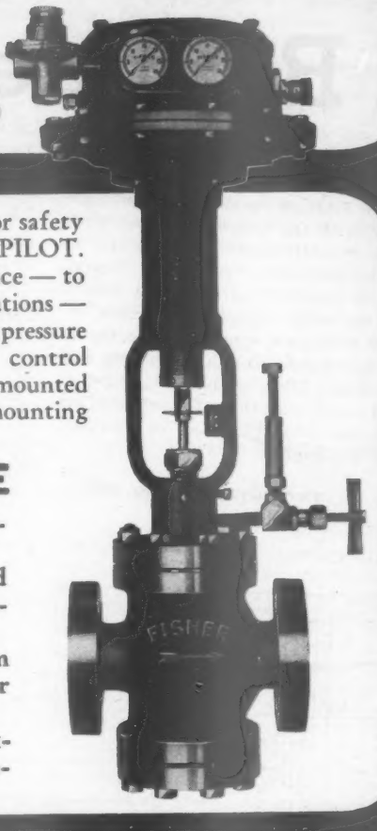


FIG. 2. INFLUENCE OF SPECIMEN SIZE ON THE RUPTURE STRENGTH OF 5Cr.Mo. STEEL.

FISHER WIZARD PILOTS

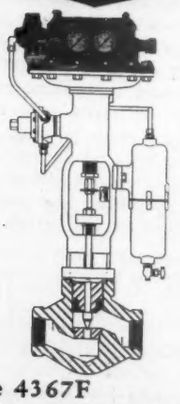
SERVE ALL PRESSURE CONTROL APPLICATIONS



For full throttling pressure reducing or relief service—safety relief or safety shut-off service — your logical choice is a FISHER WIZARD PILOT. They are applicable to standard motor valves for general service — to forged steel bodied motor valves for special high pressure applications — to butterfly valves for low pressure, large volume service—to low pressure boiler gas fuel governors — to special heavy duty, severe service control valves. FISHER WIZARD PILOTS are available in Integral mounted type for direct connected control — and in Surface or Flush mounting types for remote panel control.

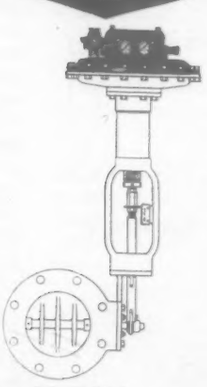
WIZARD PILOTS FEATURE

3 Different types of mounting: Integral with diaphragm casing—Surface or wall mounting — Flush or panel mounting.
Full throttling range adjustment, 1% to 75%; Vernier screw adjustment of controlled pressure setting.
Gas tight and weather proof housing for outdoor installations.
Wide range of bronze and steel Bourdon tubes for pressures up to 10,000 lbs.
Simple change-over from direct to reverse acting or vice-versa.
Simplicity of design — extreme sensitivity — absolute dependability.



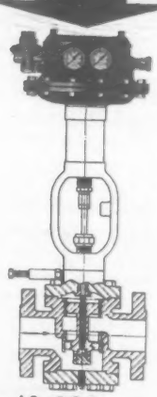
Type 4367F

Integral type WIZARD PILOT applied to forged steel bodied diaphragm control valve. Intended primarily for high pressure gas field service. Filter and auxiliary regulators are factory mounted and connected.



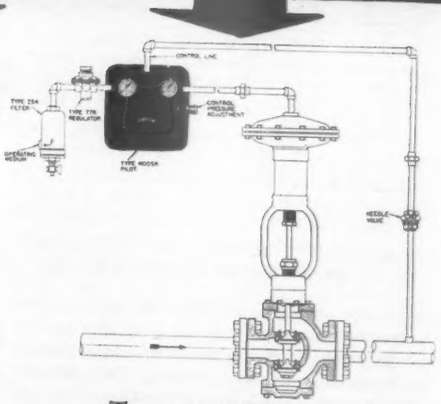
Type 43-7600

Butterfly valve assembly equipped with integrally mounted type WIZARD PILOT. Recommended for applications where it is desired to control the flow of gases under relatively low static pressures.



Type 43-580

Specially designed for high pressure relief valve service where tight shut-off is required. WIZARD PILOT mounted as integral part of upper diaphragm casing. Inner valve is piston actuated and incorporates internal pilot construction.



Type 4155SR

Surface wall mounting type WIZARD PILOT (reverse acting) with reverse acting diaphragm valve for pressure reducing service. Main valve closes on loss of operating medium pressure and closes with increasing controlled pressure.

FISHER Bulletin D gives full information on WIZARD PILOTS — your copy will gladly be sent on request.

FISHER GOVERNOR COMPANY
• 236 FISHER BUILDING •
MARSHALLTOWN, IOWA

Personal Protective Equipment Aids in Preventing Accidents

By H. W. RICHARDS
Mine Safety Appliance Co.

The prevention of accidents in the petroleum industry is being accomplished by following several parallel courses. These include personnel training, the elimination of physical hazards, and the development of personal protective devices.

Equipment is now available to protect head, eyes, face, hands, and feet from normal dangers and in addition there are many pieces of equipment designed for special use. A definite program is necessary to assure that the workmen wear these items when necessary and that they know how to operate and care for them.

ON many jobs in the petroleum industry, personal protective equipment is considered more as a working tool than as a prevention measure. These tools protect the man from the existing conditions, and in some jobs it is more economical to protect the man than it is to eliminate the conditions that exist. As an example, without the use of protective equipment the cleaning of a tank would take several times as long to accomplish. The tank would have to be steamed or aired for several hours, tested, resteamed and retested before the worker could enter to do his job, and additional tests would have to be made to establish that conditions had not changed. With protective equipment the worker can enter the tank regardless of the conditions and do the job with absolute safety before he could even prepare the tank for entering.

The safety-equipment manufacturers have developed, with the aid of industries, numerous devices which if properly used will give 100 per cent protection to the worker, but the wearer must understand thoroughly the limitations of the equipment he is planning to use, as it will afford protection only when used in the manner prescribed by the manufacturer. The U. S. Bureau of Mines and other agencies have prepared specifications that embody the minimum design and performance requirements on certain types of equipment, in order to be safe for the prescribed purposes. The bureau also examines and tests this equipment for conformity to these minimum requirements, and if they are met an official approval is granted. The major purposes of this approval system are (*a*) to encourage and aid manufacturers in the marketing and development of safe suitable equipment; and (*b*) to encourage the consumer to use safe and suitable equipment, to aid him in obtaining such equipment, and to instruct in its proper usage. A list of equipment bearing the Bureau of Mines approval labels can be obtained by addressing the bureau at Washington.

Unfortunately, accidents can happen to any part of the person so we have had to design equipment to protect a man both inside and out—from the top of his head to the bottom of his feet, and from the known and unknown hazard.

Head Protection

Let us start with the head. Head accidents are very near the top in nearly every industry's list of accidents that cause lost time. Falling tools, materials, head bumping, falls on the head, etc., cause a large percentage of the head accidents. The man can be protected by equipping him with a safety hat or cap, which can be furnished in several different designs and which are made of plastics or metal. They are light, comfortable to wear, and will last a long time as they are made of materials that are impervious to water, acid, oils, etc., and are also electric-shock proof. They will stand blows that will crush a man's head or break his neck. They are common equipment among oil-field workers, miners, and construction men.

Eye Protection

There is no piece of protective equipment that should be emphasized more than that which protects the eye. About 50 per cent of the workers in industry today are neglecting to protect their eyes properly. The cost of a lost eye is high to both the employe and the employer. There are hundreds of one-eyed workers in the United States today who can trace their handicap to improper protection.

There are two different types of goggles, the cup type and the spectacle type, with several variations of each type. The cup-type chippers goggle is probably the most commonly worn as it will give protection from frontal and side attacks, better than any other type. The lens is, of course, the most important part of the goggle. A lens must be chosen which will withstand impact and at the same time be optically ground so as not to cause distortion. The only standards that have been set up are those of the material laboratory of the Navy Yard in New York, and now a part of the Federal Standard stock catalog. There are several companies which manufacture goggles to meet these rigid specifications. Workers should be instructed in the proper way to wear goggles and periodic inspections should be made to see that the goggles are in good shape and will do the job.

Cup-type goggles are also made for gas welding, and they are of the same general design as the chippers goggle, but are equipped with a lens which will absorb the harmful rays as well as the glare. Any old colored glass not good enough for a welder. The glass in a good welders' goggle is manufactured under strict laboratory control. It is chemically compounded to stop 99 per cent or more of the infrared rays and 99 per cent or more of the ultraviolet rays, yet it permits sufficient visible light transmission to insure proper vision. It is impossible to look at a glass and tell what its efficiency may be in effectively filtering out the injurious rays, so welding lens are not only marked with the trade name, but with a number denoting the lens shade.

The choice of the proper goggle is just as important as the wearing of a goggle and one that should not be influenced by some worker's petty prejudices against the proper equipment. The above-mentioned federal specifications should be consulted in making proper selection. These specifications cover not only the proper shades for gas welding, but also the proper shades for welding helmets which are used in arc welding.

Helpers around arc-welding jobs should also be equipped with eye protection and a special type of glass is made for this work. This lens will give protection from the infrared and ultraviolet rays but will permit a greater degree of visible light. The helper should be equipped with the type of goggle or hand shield depending upon how close to the actual welding job he may be. The closer he is to the work the more protection he may need.

Welding hoods are made in numerous types and their job is mainly to protect the worker from flying sparks and the heat. The most important part of a hood is the welding lens, and it should always be protected with a thin cover glass to protect it from hot sparks which will mar its surface.

Welders' Ear Protectors

Welders' ear protectors are made of wire screen, leather bound, and fit over the ears and safeguard the welder from ear injuries caused by the entry of sparks, molten metal particles or other flying objects. They are so constructed to permit natural ventilation and do not interfere with eye protection.

Ear defenders are made of soft rubber and are so designed to cut down the noises to a point of about one-tenth their original loudness. It is possible to maintain a conversation or to hear over the phone since the ear defender is so constructed that it has relatively high insulation for frequencies below 1,000 cycles (most noises) and a nonexcessive insulation for frequencies above 1,000 cycles. Its use reduces nervous disorders, especially nerve deafness, and increases the efficiency of the worker.

Dust Respirators

The dust respirator is a mechanical filter type. The dust is removed by trapping the dust in mechanical filters during its travel through mats of fine fibers crisscrossed to form meshlike entanglements with exceedingly small tortuous paths. The filtering efficiency and the breathing resistance increases with continued passage of air laden with dust particles through the filters.

Air-line respirators are generally described as half masks equipped with a supply line which is fed from a compressed-air line. The quantity of air is controlled by the wearer, and the pressure is controlled by reducing valves in the line from the compressor to the supply line which is attached to the face piece. The quality of the air is controlled by a filter which is also in the supply line. By the use of this type of respirator the wearer is only dependent upon air furnished him from the high-pressure line and not from the air in the working place.

Gas Masks

Canister gas masks, commonly termed "gas masks," consist usually of a full-mask face piece connected by a flexible tube to a canister that is carried on the chest or back of the wearer. The

canister is filled with chemicals usually in granular form. When the harmful gases and vapors come in contact with the granules they are removed by chemical or physical reaction.

The gases or vapors against which a particular canister will give protection depends entirely on the contents of the canister. It is, however, not necessary to have a different sorbent for every kind of gas or vapor, because chemical and physical substances can be grouped to some extent in accordance with their chemical and physical reactivity with sorbents. On this basis the U. S Bureau of Mines developed a practical classification of gas mask canisters and a color code (see U. S. Bureau of Labor Statistics Bull. 512) for use in its schedule of requirements for their approval of gas masks.

Gases—vapors, smokes or mists to be protected against—	Canister type letter	Distinctive color required
Acid	A	White
Organic vapors (petroleum)	B	Black
Ammonia	C	Green
Carbon monoxide (only)	D	Blue
Dusts, smokes, mists in combination with any of of the above gases	E	One-half-inch black or white contrasting, stripe.
Other special gases	F	Color to be assigned.
Acid and organic vapors (combination)	AB	Yellow
Acid and organic vapors and ammonia (combination)	ABC	Brown
All of the above gases (combination)	N	Red. Filters are included in this canister, but stripes to indicate them are unnecessary.

Canisters are usually of 600 cc. and 1,500 cc. capacity. The large size is designated as supersize.

It is apparent from this classification that canisters may be designed for one specific gas or class of gases, or for a combination of gases or classes of gases, and the canisters may or may not include filters for mechanical separation of dusts and other heavier-than-air particles.

Masks that have the approval of the Bureau of Mines are available for protection against as much as 2 per cent by volume of acid gases, organic vapors and carbon monoxide and 3 per cent of ammonia. Most industries do not have concentrations of gases exceeding this amount in unenclosed places. Gas masks are merely air purifiers. They do not supply oxygen. For this reason they should not be used in unventilated confined places where there is a possibility of a deficiency of oxygen.

A common question is, how long will a canister last? The life of the canister is dependent upon a number of different things, and if given a known concentration of gas, with a definite rate of air flow, definite humidity, it is possible to tell how long the canister will last, but in actual use this is impossible. The canister does not break down all at once; it breaks down gradually, thus giving the wearer of the mask sufficient warning to get to fresh air and change canisters. This is not true, however, in protecting against carbon monoxide as it is a colorless and odorless gas and the mask should be equipped with a timer which tells the wearer at all times that he has so many minutes of life left in his canister. The carbon monoxide canister will last for 2 hours, and is so approved by the U. S. Bureau of Mines.

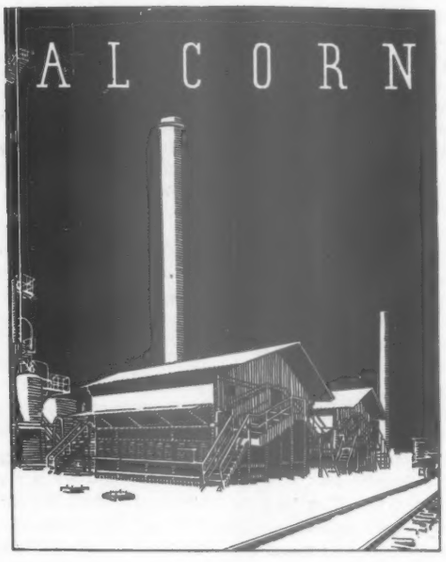
Hose Masks

Hose masks are made of the same design of face piece as the canister mask, and is supplied with a flexible tube or tubes connecting the face piece with the longer hose which is heavier and noncollapsible, and is impervious to vapors. The air is supplied by means of a hand or motor-driven blower. The main air hose is attached to the wearer's back or front by means of a safety belt or harness. If the safety belt is used a life line may be attached to a "D" ring; this enables the wearer of the mask to be recovered in case of trouble. The hose line is of a large-enough capacity and the blower and other parts are of a design that will permit the wearer to breathe air through the device without difficulty or distress even though the blower is not operating. This requirement of an unobstructed air passage is a safety feature in event something happens to the power operating the blower, whether it be a motor-driven or man-operated blower.

Hose masks with only 25 ft. of main hose may be used without a blower. The hose is placed in fresh air and the wearer of the mask pulls his supply of air through th's hose to the face piece. The resistance is very low.

Hose masks are the simplest and safest protector for use in very dangerous and emergency situations where the wearer need go no farther than 150 ft. (the maximum length approved by the Bureau of Mines) from fresh air. Hose masks that have the Bureau of Mines approval are available in one-man units and in multiple or gang units.

They are used in tanks, manholes, bunkers, and



THE FURNACE IS THE HEART OF ANY OPERATION PROCESSING OIL

INSTALLATIONS may be on large scale, built for permanence. Or may be small scale, built to utilize a new, untried, possibly soon to be exhausted field. The problems of construction vary in the two cases—and in many others in between. One factor remains constant. The cheapest way to get the best result in processing oil for any purpose is to select the best heat application procurable.

ALCORN COMBUSTION COMPANY

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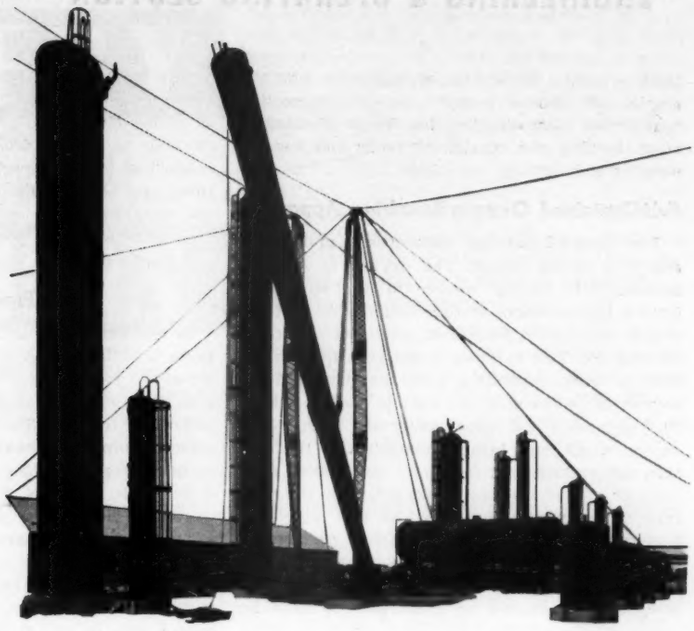

Here's the wire rope that helps you get going

You've got a big job to do. That's why you need the wire rope that helps you get going *fast*—Preformed Yellow Strand. It's the limber, easy-to-manage Rotary Line that installs quickly . . . winds evenly on the drum . . . takes heavy loads with a minimum of breaking-in. But there's stamina, too, in its strong, elastic, drawn-to-order steel wires—toughness that withstands the shocks of handling a record string of pipe at high speeds.

A Hoist or Winch Line of Preformed Yellow Strand shows the same ready adaptability. Whether it's laying a rush pipe line or safely raising a huge refinery column, Preformed Yellow Strand is highly resistant to kinking and twisting, to drum crushing, to the fatigue of bending around small sheaves. It enables men and machines to deliver their *full work-capacity* through quicker starts, fewer shutdowns, more sustained production.

In wartime it's a duty and a necessity to use wire rope *efficiently.* Install Preformed Yellow Strand of the proper size and construction and make sure of all possible aid. Its longer life will conserve steel for other pressing demands. Its low final cost will save money and widen your opportunity to serve America.

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Adequate Stocks in All Active Fields

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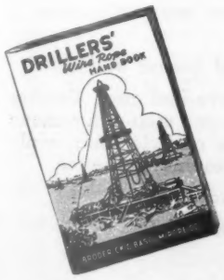

FREE—this 79-page Drillers' Hand Book of useful wire rope facts and tables. Send for it today.

YELLOW STRAND
PREFORMED
ROTARY LINE

A MAINSTAY OF NATIONAL DEFENSE

holds of ships, closed bins, wells, shafts, etc. Examples of nonemergency uses are protection against the contamination that frequently lingers after cleaning and ventilating tanks and vessels, welding and cutting operations.

Self-Contained Oxygen-Breathing Apparatus

The oxygen-breathing apparatus supplies oxygen in a closed circuit. The oxygen is supplied automatically to the wearer of the apparatus, from a high-pressure storage cylinder so that the wearer is supplied a constant supply of respirable atmosphere. This cylinder is carried either on the front or back, depending upon the type, and the wearer is independent of outside air conditions. The apparatus will give protection from gases, vapors, dusts, etc., in any concentration that the skin can endure, and from any atmosphere deficient or entirely devoid of oxygen. It is the only type of equipment that provides this degree of protection and also permits complete freedom of travel for considerable distances from fresh air. The wearer must be trained in its use and while it is not complicated or mysterious it must be thoroughly understood by the wearer, as he is usually wearing it under unusual conditions and not as a working tool.

Indicators and Detectors

These instruments are used for the rapid determinations of gas concentrations. They will show the percentage of the lower explosive limit of combustible gases, or the percentage of carbon monoxide or hydrogen sulfide and can be operated by the layman with very little instruction. They are very accurate and need the minimum amount of attention to keep in good shape.

Protective clothing is furnished for protection of the hands, arms, torso, legs, ankles and feet. There are special types for different hazards, such as rubber clothing to protect from acids, asbestos clothing to protect from heat, and leather and rubberized silk for specific jobs. Steel-toed safety shoes and boots as protective equipment for feet are becoming quite common in industry today. Steel inner soles for protection against nail punctures are available.

Program

In checking on your protective-equipment program a definite plan of procedure must be followed. In picking your men where extreme hazards exist only physically sound men should be picked for training. Study each department and if safety equipment should be furnished to do a certain job, provide this equipment and insist that it be worn. Don't let some workman unsell you on the idea. The cost of the accident that might occur will be just as great, and the responsibility will be yours entirely. The workman may have worked on a similar job a long time without incurring an injury and might be proud of this record and point out that he never wore any safety equipment, but if there is a hazard to his job it will eventually catch up with him, as his luck might not hold out forever.

Accidents are caused. Forget the accident and remove the cause. Insist that the safety equipment you have designated to be worn on a certain job be worn at all times—not just when the boss is around—and not worn when he is busy somewhere else. Instruct the men in what is expected of them when they are placed on the job. Tell them that to do the job they have been assigned it is necessary to wear protective equipment, and tell them why. Most men are reasonable if they are told why a certain requirement is made. Be prepared to meet all kinds of arguments and objections to wearing safety equipment. We all know that safety equipment may be uncomfortable at first, but you are not primarily trying to make a man comfortable; you are trying to protect him from hazards that you know exist. If he wants to be comfortable at the expense of safety send him home, and you will both be more comfortable.

Be sure to instruct the men in the proper use of safety equipment and what is expected of them, as they are entitled to know this.

In choosing your equipment consult some reputable manufacturer, don't take the advice of some worker who might have had a similar job in some other plant. The similarity of these two jobs might not have been enough to give this man the proper training in choosing equipment.

Care and Maintenance

No matter how well a protector is designed or how good a performance it is capable of giving, it must be properly cared for and maintained in good condition in order to obtain satisfactory protection from its use. This is the most important factor in the use of these appliances and yet the most frequently neglected. After each use it should be cleaned, serviced, and carefully inspected. They should always be stored in a convenient place where easy access is possible, and not among the barrels and boxes in some out-of-the-way place. Too frequently the man that wears the equipment is the only one that knows anything about it, and if he is not interested in good housekeeping his equipment will be in bad shape. This not only costs money, but it makes accidents possible.

JOHN ZINK BURNERS

Fuel scarcity is no problem if you use John Zink Series Y Burners, because this burner burns either, or both, gas and oil with the same heat pattern.

- Independently removable fuel guns.
- Uninterrupted Burner service.
- Easy to remove fuel guns. Feather weight type, one man can remove for inspection and cleaning, while the boiler remains in service.
- Easy to operate.
- Simple in construction.

John Zink Series Y Register Type Combination Burner.

— AID NATIONAL DEFENSE —

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JOHN ZINK COMPANY, Tulsa, Okla.

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REFINERY ACTIVITY AND EXPANSION

General American Transportation Completing Expansion Program

THE General American Transportation Corp. is completing an expansion program at its Carteret, N. J., terminal, located in New York Harbor, and storage capacity is being increased from 45 to 60 million barrels. Other General American tank storage terminals are located at Goodhope, La. (port of New Orleans, east bank), capacity 45,000,000 gal.; Corpus Christi, Tex., capacity 85,000,000 gal.; Galena Park (Houston), capacity 55,000,000 gal.; and Westwego, La. (New Orleans, west bank), capacity 12,500,000 gal.

With all the new Carteret tanks in operation, General American tank storage terminals will have a total capacity of 257,500,000 gal. in bulk liquid warehousing facilities available for producers and shippers. Besides adding a large number of tanks of different sizes, ranging from 200 bbl. to 96,000 bbl. in capacity, a new dock is being built at the Carteret plant of General American, the largest public terminal on the Atlantic seaboard. This new dock permits still faster handling of incoming and outgoing shipments, as well as deeper-draft vessels.

An important feature of General American terminals is their custodianship. General American negotiable warehouse receipts are accepted as the highest type of collateral. The latest safety appliances are installed at all terminals, resulting in lowest insurance rates and minimum hazards.

Many users of General American terminals maintain perpetual stocks at one or more points so that orders may be delivered with maximum speed and minimum freight charges. The terminals have ample private trackage to accommodate peak volume efficiently. There is no wharfage charge at General American's private docks.

Other services of General American include the GATX fleet of more than 55,000 special cars, supplied to railroads and industries by the trip, mile, day or year; the General American car-building plants, manufacturing all types of railroad freight cars; the Plate and Welding Division at Sharon, Pa., producing pressure vessels and other steel plate equipment; the Pre-Cooling Division, which prepares carloads of perishables for shipment; and the Aerocoach Division, which manufacturers lightweight motor coaches for all purposes.

Standard of Indiana Will Build Toluene Plant at Whiting, Ind.

CHICAGO.—Under contract with the Government, Standard Oil Co. of Indiana shortly will start construction of a plant for the manufacture of toluene, essential ingredient of explosives. The plant, which will be one of the largest of its kind in the country, will be located at the company's Whiting, Ind., refinery, and will necessitate some additions and changes in the refinery proper to supply the raw material needed for production of toluene. It is expected the plant will be completed in a year.

Negotiations still are under way by the company for the erection of an alkylation and butane isomerization plant which will materially augment the company's present facilities for the production of 100-octane gasoline.

W.P.R.A. Announces Program for Annual Meeting at St. Louis

The thirtieth annual meeting of the Western Petroleum Refiners Association will be held in St. Louis, Mo., Wednesday, March 25, 1942, in the Crystal room of the Jefferson Hotel. This will be a 1-day business meeting beginning with a morning session at 10 a.m. and concluding with an afternoon session at 2 p.m.

C. L. Henderson, president of the association, will open the meeting with a talk. Following this, Wright W. Gary, director of refining, Office of Petroleum Coordinator, Washington, D. C., will talk extemporaneously on "The Importance of Refining in Wartime Economy." At the conclusion of this talk there will be a round-table discussion, during which Mr. Gary will answer questions.

The annual election of officers and disposition of such other business as may come before the meeting will complete the day's program. There will also be a meeting of the board of directors.

Petroleum Refining Attracts Large Number of Research Workers

WASHINGTON, D. C.—The growth of research during the past 10 years has been greater in the petroleum refining industry than in any of the other major industries that maintain research laboratories and departments, according to a recent report of H. C. Miller and G. B. Shea, members of the technical staff of the Bureau of Mines.

"Next to the chemical industry more workers are engaged in petroleum research than in any other industry," the report revealed. "Fewer than 1,000 employes were engaged in petroleum research in 1927, while in 1938 there were more than 5,000, representing one-eighth of all the research workers employed by all industries in the United States during that year. Since, the number has been greatly increased. Annually, the petroleum refining industry is spending more than $20,000,000 for research."

Mr. Miller and Mr. Shea, in their reports, traced the development of petroleum refining from simple distillation through thermal cracking to the many catalytic-synthetic processes introduced since 1930, the third period in the advance of refining.

Oil-Conditioning Plant in Vermilion Field on 24-Hour Schedule

The oil-conditioning plant of Vermilion Consolidated Oils at Borrodaile, in the Vermilion field, Canada, is operating on schedule 24 hours daily, processing Vermilion heavy crude. Shipments of fuel oil amounting to 250 bbl. daily are made to the Canadian National Railways at Jasper for use on the mountain run. Contracts call for 500 bbl. daily after March 1 and 750 bbl. daily after April 1.

Canadian Government Will Make Synthetic Rubber From Petroleum

OTTAWA, Ont.—Hon. O. D. Howe, minister of munitions and supply, has announced the federal government will engage in the manufacture of synthetic rubber from petroleum. The base plant, work on which will start as soon as possible, will be at Sarnia, convenient to the refinery of Imperial Oil, Ltd. It will be in production in about 15 months. It has not been decided whether the two subsequent processes will also be carried out at Sarnia. Plants covering the three processes will cost approximately $40,000,000, and will fill a considerable proportion of Canada's rubber requirements.

Sketches of Plant Operators . . .

JAMES RAYMOND CARRINGER, general manager of manufacturing operations of Standard Oil Co. of New Jersey (Del.), principal operating subsidiary of Standard Oil Co. of New Jersey (N. J.), will soon observe his fortieth anniversary as an oil man. He began his career in the oil industry in 1903 when he was first employed in the tank-car repair shop of Standard Oil Co. of Indiana at Whiting.

Mr. Carringer was born in Olean, N. Y., in 1886, when that region was the country's principal source of oil. The family moved to Whiting, Ind., and he graduated from high school there. He was engaged in newspaper sales work as a boy from 1901 to 1903 when he went to work for Standard of Indiana.

From Whiting Mr. Carringer went to Neodesha, Kans., where he served as chief oil inspector, and later held the same capacity at Wood River, Ill. He became chief of the experimental department at Wood River and finally assistant superintendent.

In October, 1918, Mr. Carringer joined Standard Oil Co. of New Jersey as assistant general superintendent at Bayway. He became general superintendent at Bayway in 1921 and served in that capacity until 1926 when he became local refinery manager there. In 1933 he was made assistant general manager of the New Jersey refineries and manager of the Bayonne refineries.

Mr. Carringer moved to 26 Broadway in 1936 as assistant general manager of all the Delaware company's refineries. He held that position until the summer of 1940, when F. W. Abrams, then president of the Delaware company, was elected to the board of directors of the parent company. C. F. Smith, general manager of manufacturing, succeeded Mr. Smith and Mr. Carringer became general manager as well as a member of the board of directors.

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Pipe-Line Personalities . . . . Barton P. Sibole

BARTON P. SIBOLE, who became president of Stanolind Pipe Line Co. early this month, was born in Philadelphia, Pa., in 1887, the son of a Lutheran minister. On graduation from Masten Park High School, Buffalo, N. Y., at the age of 18, he became a machinist's apprentice at Buffalo Forge Co. Two years later he temporarily stopped his shop training in order to attend the University of Pennsylvania where in his senior year he was elected to Sigma Xi, honorary engineering fraternity. He graduated in mechanical engineering in 1911 and resumed apprenticeship in Pierce Arrow Motor Co.'s shops, becoming a journeyman machinist at the age of 26.

After 6 years of motor-vehicle service work, 3 of which had been spent on war trucks, he came to Oklahoma early in 1920 to take a temporary job with Sinclair Oil & Gas Co.'s motor-transport department. In 1921, when Standard Oil Co. (Indiana) acquired half ownership in Sinclair Pipe Line Co., he became assistant to the president and continued in that capacity until 1930 when Standard of Indiana acquired full ownership of the pipe line operated thereafter by Stanolind Pipe Line Co., of which Mr. Sibole has been vice president until his recent promotion to the office of president.

In 1916 he married Hildegard Bischoff, daughter of a Presbyterian minister. They have two children, Elizabeth, who resides at home, and John L., a sophomore student of forestry at Colorado State College, Fort Collins, Colo.

For about half of the past 22 years in Tulsa, Mr. Sibole has been superintendent of the Church School, First Lutheran Church. In the organization now designated as Tulsa Council of Churches, he has served since 1923 in various capacities, including secretary, president and chairman of the finance committee. Since 1940 he has been Protestant cochairman of the Tulsa Round Table of the National Conference of Christians and Jews. Currently he is a member of the Tulsa Area Council, B.S.A., chairman of the Tulsa Y.M.C.A., International Committee, member of board of directors of Tulsa Community Fund, member of board and chairman of Public Affairs Forum Committee, Chamber of Commerce, and an enthusiastic member of the Society for the Preservation and Encouragement of Barber Shop Quartet Singing in America, Inc.

Pipe-Line Activity

Oklahoma Natural Will Lay 100-Mile Gas Pipe Line

Construction of a 100-mile 12-in. natural-gas line to supply the U. S. Army Cookson Hills cantonment near Muskogee, Okla., has been announced by Joseph Bowes, president of Oklahoma Natural Gas Co.

Specifications for the $1,500,000 construction job have been completed and bids will be received in 2 or 3 weeks.

The company has been given a contract by the U. S. Army for supplying gas for the $28,000,000 project.

The line will handle more than 60,000,000 cu. ft. of gas daily. It will reach from the company's principal gas supplies in the Chickasha and Cement gas field, Oklahoma, to a junction near Stroud, Okla. Gas will be taken to the cantonment by an extension of the line between Quinton, Okla., and Tulsa.

O.P.C. Considers Application For Tinsley Pipe Line

WASHINGTON, D. C., Feb. 23.—Application is still pending clearance in the Office of Petroleum Coordinator for the pipe line proposed by Standard Oil Co. of New Jersey interests from the Tinsley field in Mississippi to the Standard Oil Co. of Louisiana refinery at Baton Rouge, La. There has been no definite policy established with respect to obtaining recommendations for materials. Each application, showing up in Washington now in the form of plea for a project rating, must be considered on its individual merits. The OPC staff members charged with approving or rejecting the applications view all requests for materials strictly on a basis of their importance to the war program.

Atlas Pipe Line Corp. Acquired by Producers

In receivership since 1939, Atlas Pipe Line Corp. has come under the ownership of the Atlas Oil & Refining Corp., an organization dominated by Magnolia, Ark., oil-field producers, who bought the refinery and pipe lines in order to gain additional outlets for their crude. The plan of reorganization was approved several months ago in federal court.

The property has been in charge of H. K. Phels, Jr., since May 26, 1939, first as receiver and then as trustee.

The setup includes a refinery at Shreveport and pipe lines to Arkansas and East Texas. Stockholders in the new concern include producers in Arkansas, Texas and Mississippi.

Wisconsin Commission Reconsiders Jurisdiction Over Pipe Lines

MADISON, Wis.—The Wisconsin Public Service Commission has scheduled a hearing for February 27 to show cause why its order granting the Wisconsin Gas Transmission Co. a certificate of authority to build a natural-gas pipe line into the state should not be rescinded.

Announced grounds for the action is the recently adopted amendment to the federal natural-gas act requiring a Federal Power Commission certificate before a natural-gas pipe line may be constructed in new territory.

"By this amendment," the commission's announcement said, "Congress apparently has preempted the field to the exclusion of any power of the State of Wisconsin with respect to authorization of the proposed construction and operation."

While the federal commission's jurisdiction is

apparent, the state board pointed out, it could not summarily rescind the authority granted to Wisconsin Transmission Co. without a formal hearing.

After a hearing here, Commission Examiner H. T. Ferguson ordered briefs on motions to dismiss the petition of Wisconsin Southern Gas Co. for authority to construct a 10½-mile pipe line from Lake Geneva, Wis., to the Illinois State line to connect with the pipe-line system of the Natural Gas Pipeline Co. of America.

The motions were based both on the new federal amendment superseding the state commission's jurisdiction and a contention by counsel for Wisconsin Gas Transmission Co. that the Wisconsin field should not be split; also that the field has been preempted by the certificate granted to the subsidiary of Phillips Petroleum Co.

Appearing in opposition to the petition, in addition to Wisconsin Gas Transmission Co., were attorneys for coal dock labor and other interests which intervened previously in attempts to bar natural gas from Wisconsin.

Solutions Are Proposed for Southwest Pipe Line Problem

Several proposals have been made by state officials and others not directly connected with the pipe-line industry for solution of problems connected with transportation from southwestern producing areas.

Jerry Sadler, member of Texas Railroad Commission, suggested to Harold L. Ickes, petroleum coordinator, on a recent visit to Washington, D. C., that sufficient pipe for two 12-in. lines from Texas to New York might be obtained by digging up certain lines now operating below capacity in Texas. Pooling agreements might be worked out among the companies, according to him, whereby transportation needs from West Texas might be taken care of by using not more than half the existing lines.

From West Texas to the coast is nearly half the distance from New York to Texas, Mr. Sadler pointed out. Mr. Sadler said that pumping stations now in use along the lines in Texas could be dismantled and used along the relocated lines, so that the question of priorities, either for pipe or pumping equipment, would not enter into the problem.

Gov. John E. Miles of New Mexico has announced that I. E. Lambert would represent him in negotiations for the proposed 900-mile pipe line from New Mexico and West Texas to the Pacific Coast. Cost of the new line is estimated at $15,000,000. No major oil interests have been mentioned in connection with either proposal.

OPC and WPB are reported to be giving attention to a proposal to extend the Baton Rouge, La.-Greensboro, N. C., refined-products pipe line to the Washington, D. C.-Baltimore, Md., area.

United Puts New Line in Operation Along Gulf Coast

The 204-mile natural-gas pipe line from the Lirette gas field in lower Louisiana to Mobile, Ala., has been completed recently by United Gas Pipe Line Co.

The pipe line, constructed to supply increasing demands for natural-gas fuel by industries along the Gulf Coast from the Mississippi River to Mobile and Pensacola, Fla., has been blown and tested at its Mobile terminus.

The new line supplements natural gas now being delivered in the Mobile-Pensacola area by the existing Jackson-Mobile line. It has been estimated that more than 70 per cent of the total capacity of the new line will be used by industries engaged in filling national-defense contracts. It assures continued dependable natural-gas service by means of the two-way supply.

Construction of this pipe line was started the first part of July, but considerable delay was occasioned by shortage of materials and frequent periods of bad weather.

In the Mississippi River 12 miles above New Orleans, a triple-submarine crossing was laid in 7 days. The river is 2,800 ft. wide at this point and approximately 90 to 120 ft. deep with a very swift current.

The most difficult part of the project came when the line was laid across Lake Pontchartrain for a distance of 25.59 miles. Serious consideration had been given to a land route, skirting the western and northern shores of the lake, but preference was given to the 25 miles across the lake, as opposed to the 37 miles by land which would have been mostly swamp construction. The lake crossing presented problems involved in the proper use of marine equipment and a gamble with one of the country's most temperamental bodies of water, but it represented a considerable saving in steel pipe. The line across the lake is reported to be the longest submerged section of pipe line in the world.

The line size of 16 in. up to the lake was decreased to 14 in. at the point of entrance on the southern shore and pipe with ½-in. wall and an outer protective coating almost an inch thick was used for the lake crossing.

The pipe was welded into lengths of approximately 2,500 ft. on shore and towed out into the lake by tugboats. Line was laid from the center of the lake into shore by means of two huge derrick barges and a welding barge. As each tow came up, one end was lifted aboard the welding barge and welded to the pipe already laid in the lake. It took only 45 days to do this job, in spite of three storms of hurricane force during which it was necessary to move all equipment from the lake.

The remainder of the line was laid from Mandeville to Gulfport and then to Mobile through the swamps and rivers of the Gulf Coast. Completion of this line forms another link in United Gas Pipe Line Co.'s system of more than 6,000 miles of main transmission lines.

Tapco Presents Plans At Hearing

WASHINGTON, D. C.—Plans for a $25,000,000 crude-oil pipe line were laid before a special examining board appointed by Director of Defense Transportation Joseph B. Eastman at a hearing late last week.

The proposal, sponsored by Trans-American Pipe Line Corp., calls for a line from Wichita County, Texas, in almost a straight line to Savannah, Ga. Tapco proposes to construct with funds from Defense Plant Corp., a government-owned company, with an option for Tapco to purchase the line after the war.

Vincent G. Shinkle, consulting engineer, testified that the line would use approximately 100,000 tons of steel, exclusive of gathering lines. Mr. Shinkle said that a tentative rate of 45 cents per barrel for the haul from Texas to Savannah has been decided upon.

Construction of the line as a defense measure was strongly urged by Representative L. M. Rivers, of South Carolina.

Col. Ernest O. Thompson, member of the Texas Railroad Commission, was also present at the hearing, as was Rear Admiral H. A. Stuart, chief of Naval Oil Reserves Division of the Navy.

The board granted the request of Paul Hadlick, Washington attorney for Tapco, for a 10-day period in which interested parties may file briefs and an additional 5 days for rebuttal. Brigadier-General Walter Pyron indicated that he would file a brief on behalf of the Army, but did not indicate his attitude towards the line.

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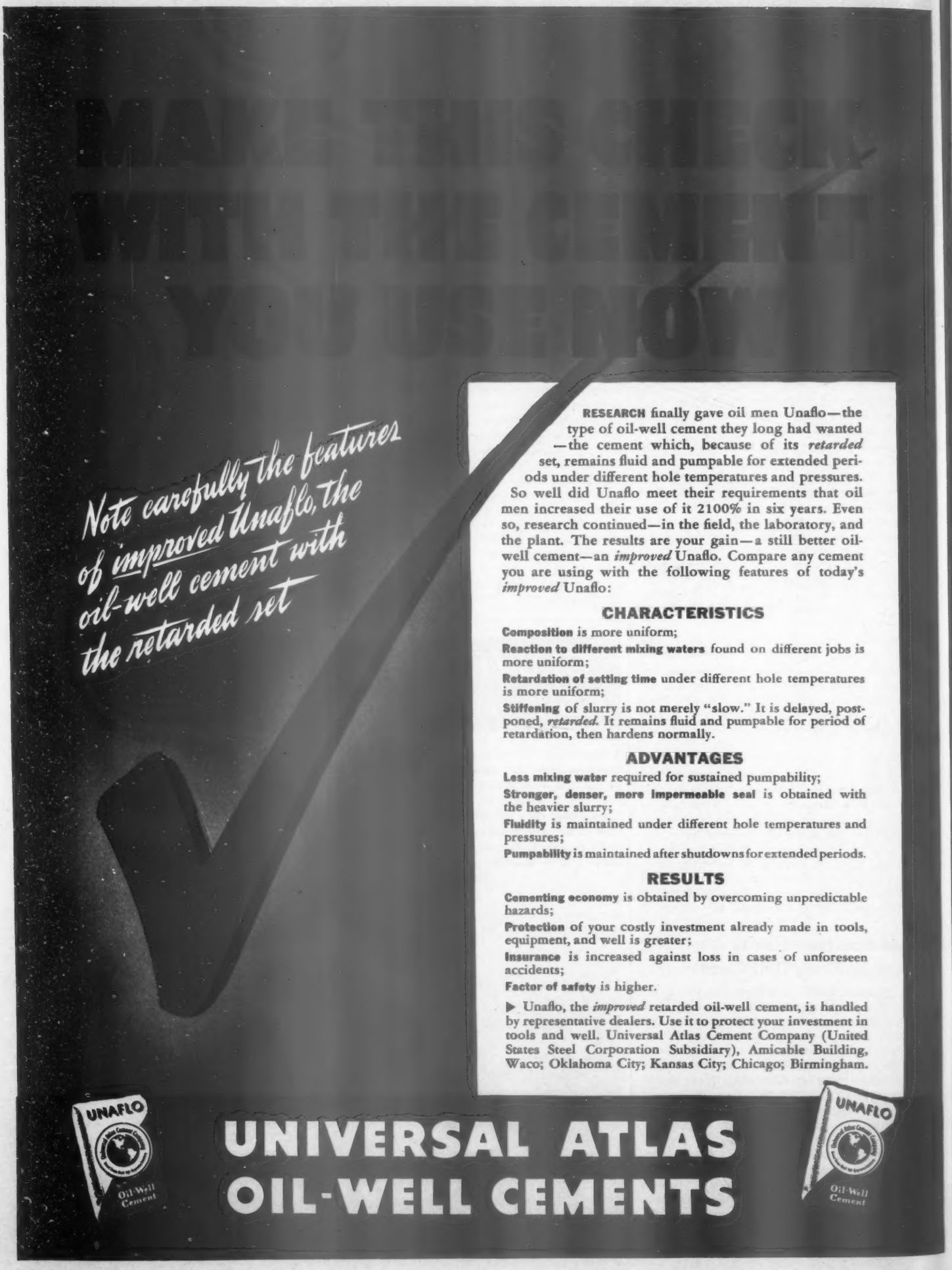

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Composition is more uniform;

Reaction to different mixing waters found on different jobs is more uniform;

Retardation of setting time under different hole temperatures is more uniform;

Stiffening of slurry is not merely "slow." It is delayed, postponed, *retarded.* It remains fluid and pumpable for period of retardation, then hardens normally.

ADVANTAGES

Less mixing water required for sustained pumpability;

Stronger, denser, more impermeable seal is obtained with the heavier slurry;

Fluidity is maintained under different hole temperatures and pressures;

Pumpability is maintained after shutdowns for extended periods.

RESULTS

Cementing economy is obtained by overcoming unpredictable hazards;

Protection of your costly investment already made in tools, equipment, and well is greater;

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Factor of safety is higher.

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions reported last week were the same as the preceding week, namely 367. Oil wells were up four, gas wells up one and dry holes down five. This does not indicate that the wildcatting campaign is increasing to any noticeable extent. In fact, compared with last year the drop of 94 completions includes a decline of 18 in the number of dry holes.

Because of the rush of completions at the start of 1942 and the slow rate at which drilling got under way last year, the total number of completions is still 118 greater than during the corresponding period of 1941. Another week may see this margin almost completely gone.

There is still much confusion among operators as to the numerous regulations governing their activity but the present trend is rapidly clearing up some of the confusion. Actually, three factors govern the number of wells to be drilled in 1942, steel, demand and transportation. At the present time, transportation is dominant. In its allocation of production for March, OPC has radically reduced Texas' allotment, thus apparently retreating from its stand that recoverable reserves should be a factor in state allocations. This is not necessarily the case in view of the fact that it is questionable whether Texas will produce even the allocated amount because it cannot get the oil to the market. Tire rationing has not yet made its effect felt on the use of gasoline but hopes that the restrictions will be lightened are fast disappearing. In fact, if spare tires are commandeered the civilian use of gasoline may be restricted greatly.

The steel situation still appears to be anybody's guess but it is safe to say that if producers cannot dispose of the production from existing wells, they are not going to be encouraged to drill more. In this, the favorable statistical position in which the industry found itself at the end of 1941 has been of inestimable service to the nation. The surplus of available oil has given the country a chance to divert steel to more pressing needs. It may even provide enough for the national-defense line which would go far toward restoring prosperity to the producer.

With Illinois again dropping off and Texas at least temporarily facing acute transportation problems, it appears likely that the demand for Mid-Continent crude will outweigh any consideration of reserves and it is quite conceivable that increased drilling may be called for in this sector. The present status of Oklahoma fields may concentrate this activity in Kansas.

ILLINOIS: A new McClosky pool, hailed as another Johnsonville, is causing excitement in Illinois. The discovery made 28 bbl. in 18 minutes on test. Four Wayne County tests are in or near the McClosky (p. 115).

KANSAS: Lost Springs and Kraft-Prusa have been extended. After the water spray was exhausted, Champlin's gas field opener in Barber County gaged 3,000,000 cu. ft. of gas (p. 117).

SOUTHWEST TEXAS: A wildcat near Yorktown, De Witt County, cored gas sands in the Carrizo and is heading for the Wilcox. The Wicox test southeast of Heard, Bee County, is also logging encouraging showings and will soon be tested. A new distillate field has been opened southeast of Orange Grove (p. 104).

OKLAHOMA: A good flow from the Layton sand promises a new field between Crescent and Edmond on the Nemaha Ridge. Wilcox gas production has been found east of Laffoon, but across the line in Okfuskee County. Two Seminole tests in the midst of old production are showing oil (p. 106).

WEST TEXAS: The discovery well of the fourth pay zone in Big Lake and the third Permian zone made 140 bbl. an hour, natural. It is believed to be the Clear Fork. Goldsmith has been extended ½ mile west and the Harding pool has been extended 1 mile northwest (p. 98).

NORTH TEXAS: Showings have been found in a shallow sand north of Muenster, Cooke County. A shallow sand is also in prospect in the New York City field. Worsham, Clay County, has a small west extension. Wildcats in Archer, Grayson, Jack, Foard and Wilbarger are showing oil (p. 109).

LOUISIANA GULF COAST: Three flank tests have extended Pine Prairie on the southeast and northeast sides. A recompletion of the deepest Wilcox well at Neale resulted in good production. A new sand is promised in the Lake Chicot field (p. 113).

ARKANSAS: With offsets to the discovery well on the west, northwest and north running low, prospects of a major pool in the Midway area dimmed. The condition may be due, however, to local faulting and the other tests now drilling will probably tell the whole story (p. 124).

CALIFORNIA: Continental's second well at Turnbull Canyon has proved a better well than the discovery (p. 102).

TEXAS GULF COAST: Gas and oil odors are reported from a Harris County test on strike with Fairbanks, Bammel and North Houston. Oil, followed by gas, was found in a test in the Ramers Island, Tyler County, area (p. 113).

EAST TEXAS: Pettit production at Chapel Hill was extended ½ mile east (p. 118).

WEST CENTRAL TEXAS: A new gas zone has been found at Wimberly. Taylor County's pool opener has been gaged at 300 bbl. in 11 hours (p. 109).

NORTH LOUISIANA: After getting showings in the Smackover, North Louisiana's deepest test is drilling ahead below 12,100 ft. (p. 124).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended February 21, 1942)

	Oil	Gas	Dry	Total	Footage	Tfl. comp. to date 1942	Tfl. comp. to date 1941
N. Y., Pa., and W. Va.	38	15	2	55	124,826	706	634
Ohio	4	6	4	14	39,474	178	187
Indiana	3	1	4	8	8,205	71	57
Kentucky	0	7	1	8	17,747	67	82
Illinois	15	1	9	25	70,911	365	405
Michigan	8	0	6	14	35,519	132	133
Kansas	26	1	9	36	126,729	288	229
Nebraska	0	0	0	0	0	5	13
Missouri, Iowa	0	0	0	0	0	1	2
Oklahoma	8	2	13	23	82,824	244	209
Texas:							
North Central Texas	12	0	13	25	59,703	309	360
West Texas	54	0	3	57	236,775	327	269
Texas Panhandle	4	0	4	8	24,333	127	71
East Texas	4	1	2	7	38,049	87	164
Texas Gulf Coast	1	0	4	5	32,017	154	139
Southwest Texas	17	0	10	27	139,946	243	211
Total Texas	92	1	36	129	530,823	1,247	1,214
North Louisiana	8	0	5	13	53,187	107	89
Louisiana Gulf Coast	10	0	4	14	135,226	116	113
Total Louisiana	18	0	9	27	188,413	223	202
Arkansas	0	0	3	3	14,188	24	23
Mississippi and Southeast	1	0	0	1	5,642	21	26
Montana	1	0	0	1	2,923	28	45
Wyoming	0	0	0	0	0	10	22
Colorado	0	0	0	0	0	2	5
New Mexico	6	0	0	6	22,115	41	47
California	14	0	3	17	111,218	168	168
Total United States	234	34	99	367	1,381,557	3,821	3,703
Total previous week	230	23	114	367			
Week ended Feb. 22, 1941	290	54	117	461			

A new venture, an indoor oil field, is proposed for a tract just outside the Los Angeles city limits. This development and a review of evidence by a reader to the effect that shale-oil development need not await higher prices are discussed on Page 96.

Indoor Oil Field Is Planned For Los Angeles Tract

By L. F. STOCKMAN

A PETITION to the Los Angeles city council for permission to undertake deep-zone development on Gilmore Island within sight of Los Angeles' Miracle Mile and adjacent to a residential district has been made by J. E. Elliott, Los Angeles petroleum engineer and former professor at Stanford University and who pioneered development of the core barrel during the boom days of Santa Fe Springs, Long Beach and Huntington Beach. The area involved is a 20-acre parcel to open land directly south of the Pan Pacific Auditorium and bounded by First, Third, Stanley and Gardner streets.

The proposal to the city council follows two recommendations which are (1) annexation of the county strip by the city of Los Angeles and (2) the passing of the necessary zoning laws to enable development of the property in question. It is proposed to erect a reinforced concrete building covering approximately 8 acres and reaching a height of 100 ft. All drilling will be done inside this projected building which will be faced with trees and shrubs and otherwise made attractive. The plan contemplates extensive use of directional drilling and every attempt has been made to satisfy property owners in the neighborhood that investments and residential property will not be jeopardized. The area proposed to be subjected to deep-zone exploration is a part of the old Salt Lake field which in the early days extended north and south of Wilshire Boulevard and east and west of what is now La Brea Avenue.

Shell to Do Drilling

Shell Oil Co., Inc., will do the actual drilling and possibly participate in any financial profits after development costs have been amortized. The site selected is located in close proximity to a new $16,000,000 apartment house project being built by Metropolitan Life Insurance Co. Mr. Elliott has leases on approximately 400 acres owned in fee by University of Southern California; Metropolitan Life Insurance Co.; A. F. Gilmore Co., and the Pan Pacific Auditorium Co. Other plans contemplate the inclusion of adjacent properties in a community lease so that owners may participate in development but still retain surface use of all property. The petition for permission to drill stipulates that no surface tanks will be erected on the property and construction of the operations building will be such that there will be no odors and that by using electric equipment drilling operations will be quiet. The building will be soundproofed and air-conditioned in such a way that obnoxious odors will be prevented from escaping into the air.

Mr. Elliott has entertained the idea of developing this property for a number of years. Geologists and engineers who attended a national meeting of the A.A.P.G. a number of years ago in Los Angeles will recall statements to the effect that possibly the largest fields in the state probably underlie the city of Los Angeles. This has been a generally accepted theory for many years and if Mr. Elliott is permitted to proceed with his project to undertake deep drilling in the old Salt Lake field this may prove true. The plan which has been worked out in minute detail contemplates development of the Miocene which should be reached in the Salt Lake area at 8,000 ft.

The city of Los Angeles will receive the difference between one-eighth and one-sixth royalty which will net the city approximately 4.16 per cent of all oil and gas produced. It is proposed to move any production secured through an old pipe line of Tide Water Associated Oil Co. which has been abandoned for a number of years instead of building any tankage within the projected housing in which all drilling will be done. The mechanical features of the plan are entirely feasible and the only thing that cannot be foreseen is whether the necessary permission may be granted. Structurally the Salt Lake field is a normal anticline complicated by faulting not the least of which is the fault forming the celebrated La Brea tar pits. Instead of using a standard derrick it is proposed to use an overhead crane for pulling pipe or running casing or tubing and to take care of the regular lines.

There is every reason to expect that Miocene production should be developed in the Salt Lake field and by using directional drilling numerous wells should be completed. Obviously it will be necessary to use the heaviest of equipment as a blowout would cause serious damage especially when enclosed in a building. Serious consideration would have to be given to the safety factor and double blowout preventers would be advantageous. Development work would be very efficient, however, and would enable the operator to use central mud controls and flow meters instead of visible tanks. A central manifold would probably be used to equalize pressures between wells flowing into a common pipe line and a small booster station might be required with suction at the southern end of the pipe line at the refinery. The fact that Shell would undertake all development work indicates the feasibility of the mechanical factors involved and tends to indicate also that a market would be provided for any and all crude oil produced.

The Miocene at this location could be expected to produce a high gravity crude and considerable natural gas with a high gas-oil ratio. The stipulation that property owners holding adjacent acreage in the form of lots would be enabled to participate in the development program through the formation of community leases might remove any objection from those participating but would not remove objections from nonparticipating property owners.

Oil-Shale Development May Be Possible at This Time

IT is commonly believed that development of shales and the retorting of the enormous reserves of oil which they contain will not be feasible for many years. A statement to this effect in The Oil and Gas Journal (Nov. 27, 1941, p. 27) elicited a reply by H. G. Slusser, of Denver, Colo., which indicated that this popular belief may not be correct. Mr. Slusser's letter is summarized below in the hope that it will stimulate additional research on this problem.

"The best-known experimental work on oil shale was done by the Bureau of Mines during the early 1920's. Admirable as was this work for its day, a clue to its present application to the subject might be one of its conclusions that large refining losses would be expected due to the necessity of eliminating unsaturates in the finished products. Many of its findings, however, were accurate and useful.

"The production of crude shale oil, which in all probability will never exist as such, as I shall show later, is divided into two parts, mining of the shale and its retorting. More misinformation than would be thought possible exists about the mining of shale. Why methods and costs appropriate to Scotch oil shale beds or thin seam American coal operations have been accepted in appraising a Colorado shale operation is a question for those who accept them to answer.

"The two methods which will be used are, first, open-quarry operations; and, second, where this is not possible, the block-caving system. The feasibility of the use of either of these methods depends upon retorting technique which will be be touched upon later. At the moment we are concerned with costs of delivery to the retorts of enough oil shale to produce a barrel of oil.

"These methods were carefully studied a few years ago by a reputable mining engineer. He learned that an average cost per ton of the proven open-quarry operations in use by the low-grade copper producers, certain limestone producers, and comparable open-pit coal producers, laid down crushed at the point of delivery, was slightly under 20 cents per ton of material mined. Translating these costs to an oil-shale operation by allowing for differences in specific gravity, powder necessary to break, etc., enough shale to produce a barrel of oil could be delivered to the retorts for slightly under 40 cents, including operating overhead. As stated, this figure includes only proven methods the costs of which are well known. Block-caving systems, also used by low-grade copper producers, will add from 20 to 30 cents per barrel of producible oil to the above figures, depending upon the details of the particular operation. Obviously the more favorable quarry operations will be used first.

Nevada Shale Retorting Successful

"Although his work was not completed in time to be available to the early Bureau of Mines experimentors, by far the most successful retorting operation of American shale was done by R. M. Catlin at Elko, Nev., during the middle 1920's. Using his manufacturing experience with his scientific training he developed a retort which operated continuously for many weeks at a time with entire success.

"Translating Mr. Catlin's costs into present-day costs by the proper additions due to the increased price of labor today, and charging plant equipment at recent but not defense-boom levels, the total of mining and retorting costs rises to a shade over 90 cents per barrel. To this must be added about 20 cents per barrel for general overhead, inciuding taxes, and from this amount must be

(Continued on Page 121)

4,068 TONS OF ~~DERRICKS~~ *Steel* SAVED BY 8 FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS UNITS

Plus

SAVINGS IN RIG-UP, TEAR-DOWN & MOVING

Eight Franks portable servicing units are eliminating 4,068 tons of steel as shown by the following table:

Unit No.	Mounted On	Derricks Each Unit Eliminates*	Tons of Steel Saved
1	Truck	60	540
2	Truck	45	405
3	Truck	75	675
4	Truck	72	648
5	Truck	49	441
6	Truck	51	459
7	Trailer	48	432
8	Truck	52	468
TOTAL	8	452	4068

*Number saved depends on locality.

Besides the value of this saving to our all-out war effort, it can easily be seen the savings afforded operators in derrick cost alone. Additional savings are made by the faster rig-up, tear-down and moving facilities built into Franks units.

Left, Franks telescoping derrick servicing unit capable of 10,000 ft. work. Note rods and tubing stacking facilities. Above shows over-the-road position.

MAIN FEATURES

Can be used for "slim-hole" drilling, deepening and cleanout work with rotary attachment; 100 percent portable; derrick raised and lowered in 7 minutes by power screw device; requires only four guys; lines and block remain strung in moving; models for shallow to 10,000 ft. wells.

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FRANKS MFG. CORP.
WELL SERVICING AND DRILLING UNITS
TULSA, OKLAHOMA

Discovery Well in Fourth Big Lake Pay Zone Is Completed

By ROBERT INGRAM

MIDLAND, Tex. — The Big Lake field of Reagan County, the first of 15 Ordovician oil-producing areas in West Texas, was given its fourth pay horizon this week with the completion of Big Lake Oil Co. 19-C University. The new pay level is the third and the deepest in the Permian lime.

No. 19-C University was completed for a natural daily potential of 3,423.66 bbl. of 42.2-gravity oil. Daily potential was based on a 4-hour flow, which yielded hourly 131.6, 135, 144, and 159 bbl. of oil. Flow was through open 3-in. tubing set at 4,373 ft., just off bottom and the oil flowed to tanks through two 3-in. flow lines. Oil was cut 2.2 per cent by wash water.

Gas volume was estimated at 1,806,000 cu. ft. daily. Flowing pressure on the casing was 900 lb. and pressure on tubing was 160 lb. The oil is believed coming from the Clear Fork formation of the lower Permian. The Big Lake field derives Ordovician production from a section of the Ellenburger lime around 8,500 ft. The two other Permian producing formations are the Big lime at 2,400 ft. and the Big Lake limestone at 3,000 ft.

The new producer is located in Section 24, Block 9, University Lands Survey. It is on the northeast edge of the field.

Barnhart Field Due Additional Exploration

Reagan County's other Ordovician producing area, the Barnhart field, is in line for additional exploration. M. H. Reed has filed application for four 9,500-ft. tests to be drilled on two 80-acre leases east of the field. Two Ellenburger producers of Amerada Petroleum Corp. now comprise the Barnhart field.

Reed 1-A University will be drilled in Section 2, Block 48, University Lands Survey, ¾ mile east of Amerada 1-RA University, the discovery well. The operator's 2-A University, in the same section, will be a diagonal northwest offset to Amerada 1-RD University, now drilling at 9,228 ft.

No. 1-B University is located in Section 9, 1 mile east of Amerada 1-RB University, second well in the field. No. 2-B University has been staked in the NE NE Section 9, Block 48, University Lands Survey.

Extension Indicated for Goldsmith Pool

The Goldsmith pool in northwestern Ector County may be extended ½ mile west if testing operations, now under way at Clifford Mooers 1 J. D. Slator, are successful. No. 1 Slator swabbed 1 bbl. of oil per hour natural at 4,266 ft. before being acidized with 1,000 gal. Operator has set 5½-in. casing at 4,200 ft.

No. 1 Slator was cleaned out after initial acid treatment and flowed 12 bbl. of fluid hourly, 30 per cent water. Location is in Section 12, Block 45, T.&P. Survey.

Winkler County Wildcat Tests Oil and Gas

A decrease in oil production was reported during the week at Ralph Lowe 1 Brown-Altman, Section 24, Block B-5, P.S.L. Survey, prospective Winkler County wildcat. The test had been making considerable oil and gas during testing operations at 3,098 ft. Gas volume was estimated at 5,000,000 cu. ft. daily and oil production was estimated at 150 bbl. daily. However, in drilling deeper, 1 Brown-Altman picked up a gas pocket at 3,141 ft. and at 3,159 ft. oil flow dropped to around 90 bbl. daily. At last report the wildcat had drilled to 3,212 ft. and plugged back to 3,187 ft. in an attempt to effect water shutoff.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hour rating based on last 3 hours of 6-hour gage)

Wildcats

Pecos County: Anderson-Prichard 1 H. E. Brown, elev. 2,483 ft., dry at 5,200 ft., top detrital 4,890 ft., top Ellenburger 4,917 ft.

Reagan County: Big Lake Oil Co. 19-C University, elev. 2,677 ft., 3,423 bbl., top Blaine lime 2,877 ft., pay 4,212-4,361 ft.

Fields

Abell, Pecos County: Magnolia 3 Bowman, elev. 2,393 ft., 1,762 bbl., ½-in. choke, top Simpson 4,860 ft., top Tulip Creek 4,920 ft., top McKee sand 5,034 ft., pay 5,270-80 ft.

Magnolia and Abell 3-A Myrick-State, elev. 2,308 ft., 698 bbl. oil and 5 per cent water, ½-in. choke top Tulip Creek 4,855 ft., top McKee sand 4,930 ft., top Ellenburger 5,755 ft., 1,000 gal. acid 4,875-82 ft.

Apco-Warner, Pecos County: A. W. Thompson 2 Gregg, elev. 2,441 ft., 2,248 bbl., ¾-in. choke, top Ellenburger 4,630 ft., 5,000 gal. acid 4,630-4,700 ft.

Estes, Ward County: Texas Pacific Coal 16 Baker, elev. 2,523 ft., 44 bbl., pumping, pay 2,642-50 ft., old well drilled deeper, old T.D. 2,407 ft.

Foster, Ector County: Continental 9-B Johnson, elev. 2,972 ft., 324 bbl., 375 qt. shot 4,180-4,300 ft.

C. O. Davis 1 G. Judkins, 1,134 bbl., 400-qt. shot 4,357-4,443 ft.

Trans-Southern Petroleum Co. 1-A Holt, elev. 3,087 ft., 8 bbl., pumping, 656-qt .shot 4,380-4,565 ft., old well drilled deeper, old T.D. 4,400 ft.

Goldsmith, Ector County: Drilling & Exploration Co. 1 Kone, elev. 2,929 ft., 222 bbl., ⅞-in. choke, 425-qt. shot 4,186-4,311 ft.

Gulf 283 Goldsmith, elev. 3,194 ft., 1,144 bbl., 4,000 gal. acid 4,187-4,257 ft.

Gulf 284 Goldsmith, elev. 3,154 ft., 440 bbl., 4,000 gal. acid 4,201-4,221 ft.

Hendrick, Winkler County: Gulf 199 O'Brien, elev. 2,722 ft., 99 bbl., 458-qt. shot 2,719-2,949 ft.

Johnson, Ector County: Sinclair 33-C Johnson, elev. 3,033 ft., 783 bbl., 330-qt. shot 4,083-4,168 ft., T.D. 4,173 ft.

Jordan, Crane County: E. E. Fogelson 5-C University, elev. 2,817 ft., 554 bbl., 955-qt. shot 3,445-3,672 ft., T.D. 3,675 ft.

Texas 8-A University, elev. 2,800 ft., 287 bbl., pumping, 300-qt. shot 3,502-70 ft., T.D. 3,590 ft.

Keystone (Colby sand), Winkler County: Richardson & Bass 7-A Jenkins, elev. 2,978 ft., 273 bbl., 1-in. choke, 280-qt. shot 3,402-92 ft., T.D. 3,502 ft.

Standard 36-19 Baird, elev. 2,908 ft., 212 bbl., 300-qt. shot 3,246-3,360 ft., T.D. 3,370 ft.

Lehn, Pecos County: Standard 4 Smith, elev. 2,822 ft., 178 bbl., pay 1,728-77 ft.

McCamey, Upton County: Gulf 10-E Sherk, elev. 2,751 ft., 9 bbl., pumping, 100-qt. shot and 3,000 gal. acid 2,330-70 ft., T.D. 2,379 ft.

McElroy, Upton County: Gulf 266 McElroy, elev. 2,626 ft., 356 bbl., 700-qt. shot 2,715-2,865 ft., T.D. 2,875 ft.

Noelke, Crockett County: A. J. Rife 2 Cohen estate, elev. 2,444 ft., 340 bbl., 1-in. choke, pay 1,135-64 ft.

North Cowden, Ector County: Carl B. King 2-A Holt, elev. 3,090 ft., 409 bbl., 130-qt. shot 4,353-87 ft.

Stanolind 6 Holt, elev. 3,072 ft., 187 bbl., pumping, 734-qt. shot 4,430-4,700 ft., T.D. 4,720 ft.

Texas 20 Holt, elev. 3,091 ft., 832 bbl., 350-qt. shot 4,500-4,740 ft., T.D. 4,750 ft.

North Ward, Ward County: Gulf 198 O'Brien, elev. 2,649 ft., 188 bbl., 360-qt. shot 2,560-2,640 ft., T.D. 2,645 ft.

Gulf 200 O'Brien, elev. 2,681 ft., 389 bbl., 400-qt. shot 2,610-2,715 ft., T.D. 2,720 ft.

Walker, Pecos County: Cardinal 4-K White & Baker, elev. 3,003 ft., dry at 2,050 ft.

World, Crockett County: H. G. Eastham 1-X Powell-Gulf, 86 bbl. oil and 25 bbl. water, pumping, 1,500 gal. acid 2,655-75 ft.

NEW WILDCAT LOCATIONS

Pecos County: Gulf 1 W. T. Shearer, H.&G.N. Sur., Blk. 10, Sec. 135, 660 ft. from SW and 1,980 ft. from SE lines of section, Ordovician test.

Pecos County, semiwildcats: Stanolind 1 W. A. Wright, H.&T.B. Sur., Blk. 3, SW SW of Wright tract, Ordovician test.

Stanolind 1 F. L. Sharp, H.&G.N. Sur., Blk. 9, Sec. 22, Lot 12, 648 ft. from S and 672 ft. from E lines of section, Ordovician test.

Ward County: Darby Petroleum Co. 1 University, Blk. 16, Sec. 19, 660 ft. from S and 1,980 ft. from W lines of section, 3,500-ft. rotary test.

NORTHERN WEST TEXAS

A 1-mile northwest extension for the Harding pool of Howard County was assured this week as Moore Brothers 1 Brindley, Section 18, Block 33, T.&P. Survey, established a daily potential of 70 bbl. on pump. The test had been idle when operators ran plug. A large amount of fluid was reported in the hole and operators decided to plug back from 3,315 ft. to 3,250 ft. and test. The wildcat was shot with nitroglycerin opposite a section of tight lime.

Drill-Stem Scheduled for Dawson County Wildcat

Two miles northeast of the Cedar Lake field in Dawson County, Magnolia 1 Scanlon, Section 113, Block M, E.L. Survey, recovered only 30 ft. of mud on a 45-minute drill-stem test at 4,940-50 ft. Operator decided to make the test after the wildcat encountered a show of oil and water in a core taken from 4,960-70 ft.

The core returned 4 ft. of dry lime, 4½ ft. of porous lime bleeding oil and showing water and 1½ ft. of dry lime. No additional shows were found in coring below 4,970 ft. No. 1 Scanlon is drilling below 5,070 ft.

Increase in Gas Volume at Fullerton Oil Co. 1 Wilson

Apparently efforts made by operator at Fullerton Oil Co. 1 Wilson, Andrews County prospective discovery, to obtain an increase in gas flow have been partially successful. No. 1 Wilson has been plugged back from 8,005 ft., total depth, to 7,280 ft. and operator has perforated casing at three different levels. Last reperforating job was completed this week from 7,045-7,112 ft. After perforating casing, operator treated the test with 1,500 gal. of acid. The test was allowed to unload, after which it flowed 16½ bbl. of oil per hour for 7 hours, with gas volume estimated at 215,000 cu. ft. daily.

Tubing was pulled and rerun to 7,241 ft. with packer set at 6,638 ft. No. 1 Wilson then flowed 36 bbl. of oil the first hour and 19 bbl. the second hour. Gas volume was 200,000 cu. ft. Operator is continuing to test.

NORTHERN WEST TEXAS COMPLETIONS

(24-hour rating based on last 3 hours of 6-hour gage)

Wildcats

Mitchell County: Butler & Horn 1 C. H. Brown, elev. 2,087 ft., dry at 3,203 ft., top lime 1,440 ft.

Fields

Cedar Lake, Gaines County: Continental 3-A Willard, elev. 3,533 ft., 519 bbl., ¾-in. choke, 9,000 gal. acid 4,860-5,025 ft.

Stanolind 2 Collett, elev. 3,089 ft., 704 bbl., 750-qt. shot 4,660-4,800 ft., T.D. 4,835 ft.

Emma, Andrews County: Texas 19 Holt, elev. 3,106 ft., 35 bbl., pumping, 360-qt. shot 4,580-4,765 ft., T.D. 4,780 ft.

Texas 4-J University, elev. 3,683 ft., 442 bbl., 8,000 gal. acid 4,225-4,300 ft.

Iatan-East Howard, Howard County: Mid-Continent 1-B Denman, elev. 2,298 ft., 344 bbl., pumping, 490-qt. shot 2,615-2,856 ft., T.D. 2,861 ft.

Sharon Ridge, Scurry County: James H. Beall 3 Sorrels, elev. 2,262 ft., 141 bbl. oil and 2 per cent water, pumping, 240-qt. shot 1,604-1,765 ft., T.D. 1,786 ft.

Coffield & Guthrie 3 Burney, elev. 2,286 ft., 71 bbl., pumping, 370-qt. shot 2,300-2,450 ft.

D. & R. Oil Co. 14 Burney, elev. 2,277 ft., 146 bbl., pumping, 930-qt. shot 2,212-2,461 ft.

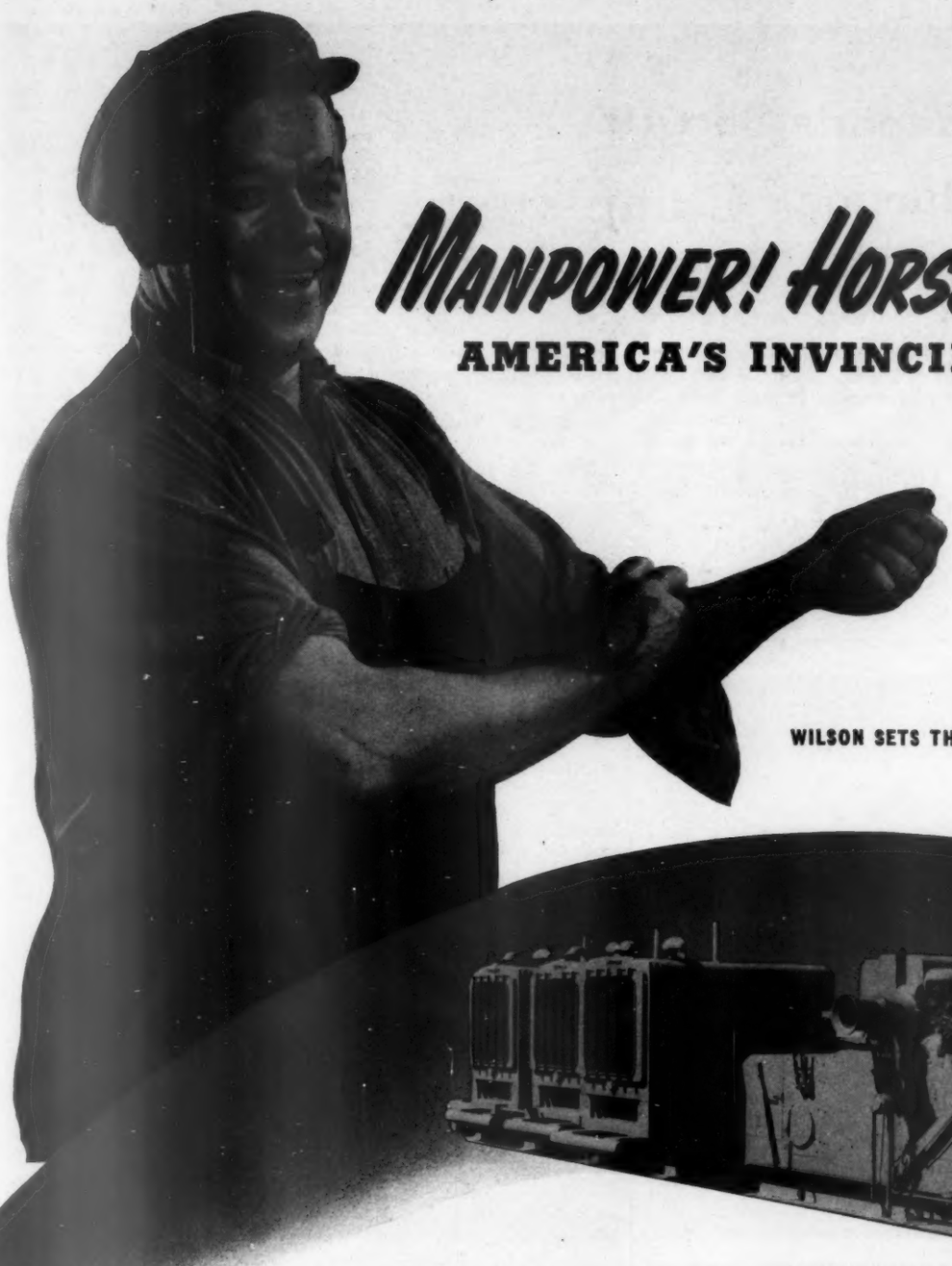
Slaughter, Cochran County: Anderson-Prichard 6 Woodley, elev. 3,683 ft., 424 bbl., pumping, 29,250 gal. acid 4,911-65 ft., T.D. 5,040 ft.

Magnolia 6-B Mallett, elev. 3,641 ft., 1,274 bbl., 3-in. casing outlet, 10,500 gal. acid 4,950-5,013 ft.

Magnolia 23 Woodley, elev. 3,686 ft., 816 bbl., 3-in. casing outlet, 10,500 gal. acid 4,938-5,000 ft.

Magnolia 25 Woodley, elev. 3,668 ft., 683 bbl., 3-in. casing outlet, 10,000 gal. acid 4,925-70 ft.

(Continued on Page 125)



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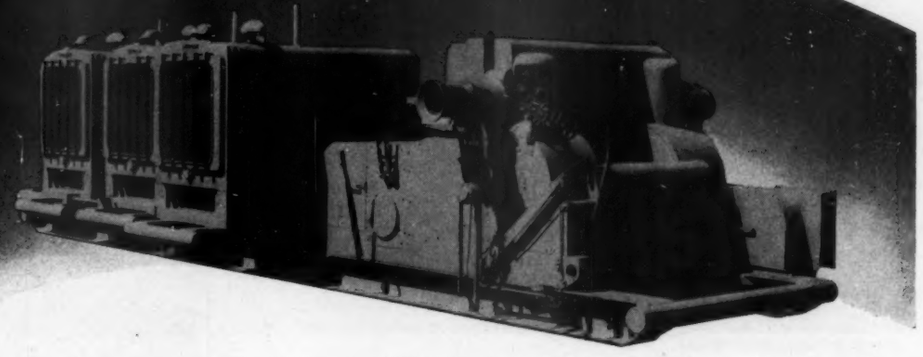

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CANADIAN FIELDS

Official 1941 Reports Show Increased Production

By VICTOR LAURISTON

CHATHAM, Ont.—Crude production from all Alberta fields in December totaled 833,566 bbl. Of this, Turner Valley provided 820,433 bbl. of limestone crude, 324 bbl. shallow crude and 2,891 bbl. of limestone naphtha. Natural gasoline from Turner Valley absorption plants in December totaled 34,185 bbl. from 3,500,352,000 cu. ft. of gas. Natural-gas production in December totaled 6,088,411,000 cu. ft. This included: Turner Valley, 4,932,832,000 cu. ft.; Viking-Kinsella, 702,129,000 cu. ft.; Medicine Hat-Redcliff, 331,421,000 cu. ft.; other fields, 122,029,000 cu. ft. Natural gas burned or blown into air in December totaled 2,639,281,000 cu. ft.

Crude-petroleum stocks in Alberta as of January 1, 1942, were 347,932 bbl., a decrease of 38,259 bbl. from December 1, 1941. Refined-petroleum stocks in Alberta as of December 1, 1941, were 828,185 bbl., an increase of 18,747 bbl. over November 1, 1941.

Turner Valley limestone oil wells had an average gas-oil ratio of 3,550 cu. ft. in December compared with 3,630 cu. ft. in November and 4,030 cu. ft. in December 1940.

For all Alberta fields in 1941, crude production totaled 9,615,321 bbl. or 26,344 bbl. daily, an increase of 1,394,486 bbl., or 3,882 bbl. daily over 1940. Of this, 9,504,111 bbl. came from Turner Valley limestone crude producers. Crude production from outside fields in 1941 included: Red Coulee, 11,626 bbl.; Wainwright, 11,733 bbl.; Del Bonita, 4,393 bbl.; Dina-Ribstone, 2,894 bbl.; Lloydminster, 416 bbl.; Steveville, 19,587 bbl.; Taber, 5,600 bbl.; Vermilion, 22,053 bbl. Natural gasoline recovered by Turner Valley absorption plants in 1941 totaled 293,122 bbl. or 803 bbl. daily, an increase of 54 bbl. daily over 1940.

Drilling activity in 1941 reached a new high, with a total of 491,339 ft. of hole; compared with 370,104 ft. in 1940. The 1941 footage included: Turner Valley, 376,676 ft.; other oil fields, 51,824 ft.; gas fields, 16,123 ft.; exploratory drilling, 46,716 ft. Turner Valley completions in 1941 totaled 45; two were abandoned due to being too low on structure and penetrating the water horizon; there were 42 producers, including two wells finished in 1940; and three wells were still testing at the end of the year. Producing wells in Alberta in December totaled 241, of which 220 were in Turner Valley.

Natural-gas production in 1941 totaled 62,470,009,000 cu. ft., of which 28,305,429,000 cu. ft. represented fuel demand and 34,164,580,000 cu. ft. was waste.

Current Production Figures

Crude and natural-gasoline production from all Alberta fields for the week ending February 9 average 29,789 bbl. daily, a record high comparing with 28,102 bbl. daily in the previous week and 25,997 bbl. daily for the corresponding week of 1941. The daily average included 28,367 bbl. of crude and 1,103 bbl. natural gasoline from Turner Valley and 319 bbl. of crude from other fields. There were 198 producing oil wells, with 35 drilling, 1 finished, 9 testing, 1 suspended, 1 standing, 4 spudded and 4 drilling licenses.

Large Crude Producers

With tests still unfinished, Major Oils 4, LSD 8, 8-21-3w5, in North Turner Valley, completed at 7,836 ft., looks like the largest producer in the field. After acidizing, the well under back pressure flowed 2,054 bbl. in a 24-hour test. Atlas-British Dominion 2, LSD 4, 17-21-3w5, finished at 8,710 ft., with Madison lime at 8,285 ft., was acidized in both upper and lower zones with 8,000 gal., and flowed 80 bbl. an hour. Atlas 2 is the most northerly completion in the field, being ¾ mile northwest of Major 4.

Eastern Sarcee Test

Western Exploration Co. of Calgary, headed by C. T. Fillan, has located a test in LSD 7, 36-23-4w5, on holdings of 1,400 acres leased from the dominion government on the east side of the Sarcee Indian reserve. Location is 3½ miles north and east of Major Oils 11, the most northerly active test on the potential extension of the North Turner Valley producing area; and will bring the active drilling within 17 miles of the city of Calgary. The Madison lime is expected around 6,000 ft., the location being apparently higher on structure than recent North Turner Valley wells.

Monitor Tests Production

In the Monitor area, eastern Alberta, McColl-Frontenac 1, LSD 4, 5-32-4w4, bottom at 3,803 ft., has been plugged back to test two potential oil horizons, one in the Devonian limestone. The test got the Madison lime at 2,900 ft.

It's a Fact — Johnston

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"WHY SET CASING BEFORE YOU KNOW!"

ROCKY MOUNTAIN

Wildcat Campaign Probably Delayed

By T. R. INGRAM

DENVER, Colo.—Wildcat operations in the entire Rocky Mountain area, which have been slowed down since the middle of December by heavy snows and cold weather, had another setback the past week by a near blizzard which further handicapped those which have been able to keep going. It now looks as though the spring drilling campaign which usually starts in April and May will be delayed this year until early summer as heavy and packed snows have made transportation to locations unusually difficult.

Usually this time of year it is possible to forecast the wildcat play, but this year considerable uncertainty exists among the operators on account of unsettled conditions such as priorities, limitations expected on the number of wildcats to be permitted and other factors arising out of the war. However, it is believed that exploration will go ahead on a larger scale than last year and will include several important wildcats.

Completions in the Rocky Mountain area were down to only one well, an average producer in the Cut Bank field.

Sinclair-Wyoming 1 Mary Carter, an important wildcat on the Sherrard dome, Carbon County, Wyoming, has resumed drilling after having to rebuild rig destroyed by fire. It is drilling at 4,890 ft. and should be in the objective Tensleep this week.

Sinclair-Wyoming 25-C, SE SE NW 25-26n-87w, East Ferris dome, due east of the Mahoney field, a wildcat headed for the Tensleep, is bottomed at 4,999 ft. and had the top of that horizon at 4,838 ft. It had some small shows which are not commercial, and probably will be abandoned. The field has some production in shale in upper horizons and a gas well in the Sundance.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Frances Oil 2 Tribal-201, CEL SE NE 30-32n-5w, T.D. 2,923 ft., 7-in. 2,859 ft., Sunburst sand 2,825-75 ft., show oil 2,850-75 ft., Cut Bank 2,880-2,911 ft., main pay 2,908-11 ft., swabbed 95 bbl. first 24 hr., preparing to shoot with 140 qt. at 2,875-2,911 ft.

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Second Turnbull Canyon Well Makes Good Producer

By L. P. STOCKMAN

LOS ANGELES. — Continental Oil Co. removed any doubt about the value of its discovery in the Turnbull Canyon field this week by completing 2 Turnbull Canyon flowing 799 bbl. of clean 27.4-gravity oil daily from 3,707 ft. Continental discovered this new field in Los Angeles Basin late last year and although the discovery well did not have sufficient kick to flow it made a good pumper doing 200 bbl. daily. In view of the large production shown by the second well in the Turnbull Canyon field and the more favorable and larger amount of oil sand it appears the discovery well is located quite close to the edge of the field. A slow but consistent increase in the amount of water produced also tends to confirm this. The exact structural condition controlling the accumulation of oil and gas in the Turnbull Canyon field remains to be determined as Continental is not at all certain about the structure in the light of the two wells drilled to date. The company drilled the discovery well in this area on the basis of a plunging nose complicated by faulting and while this may be true it is also possible that the accumulation in the Turnbull Canyon field may be a fault trap with the Turnbull Canyon fault, which has a northwest to southeast trend, being the dominating feature of the accumulation.

Continental's second completion in the Turnbull Canyon field, which is making 500,000 cu. ft. of gas per day along with the oil, has 247 ft. of good oil sand with excellent porosity and permeability. This well was originally drilled to 3,792 ft. but was subsequently plugged back and whipstocked to the north when the bit went through the Turnbull Canyon fault. It is interesting to note that practically all of the several dry holes drilled in this district to date have been located south of this fault and that Continental's two wells are north of it.

Future development of the Turnbull Canyon field will be watched with interest in view of the provisions of M-68 which prohibit the drilling of any well on less than 40 acres. If this order is enforced strictly there will only be a very few wells drilled because the productive acreage of the field is expected to be quite small and the numerous leases are for the most part held in small blocks and in some cases limited to a few town lots. Continental Oil Co. has most of the potentially productive acreage and will be able to drill several additional wells on the basis of one well to each 40 acres. Operators holding adjacent acreage are wondering what they can do as in some cases it is impossible to pool enough town lots and small acreage holdings to form 40-acre units. These independent operators will undoubtedly ask for exceptions.

The advantage of community leases in cases of this kind is clearly indicated by the status of some of the parcels involved. When Continental went into this district, it did so on the probability that the field would prove to be a normal one although the existence of the Turnbull Canyon fault was definitely known and had been mapped several years ago by Walter English. What the company did not know, however, is that the main fault would terminate the productive acreage so far north. The net result of this is that landowners who signed the community lease will participate even though their respective properties may be located south of the fault and therefore nonproductive. When Continental's 2 Turnbull Canyon drilled through this fault it automatically reduced the potentially productive acreage by almost 50 per cent.

This field was discovered as a result of field geology by Continental's geological department, of which Roy Barnes is head, supplemented by a seismograph survey. The field should prove highly remunerative because of low drilling costs in as much as relatively large production should be developed at comparatively shallow depths, 3,750-4,000 ft. The formations are conducive to rapid drilling and no troublesome water problems are expected. This shallow field is in direct contrast with the Wasco and Shafter fields which Continental discovered in the San Joaquin Valley and in which deep production has been developed.

Buena Park Wildcat Still Testing

Texas Co. is still working on 1 Spencer, a wildcat in the Buena Park district of Los Angeles Basin, and still has another several days' work in as much as a recement job will be necessary to plug up some of the perforations made during the series of tests under way. This wildcat is the best looking wildcat drilled in the Buena Park district up to the present time and is expected to show small production upon completion. Present plans call for completion at 8,932 ft. with an interval open at 8,900-32 ft. This zone flowed for a short time a week or so ago at a daily rate of 150 bbl. but production showed a cut of about 25 per cent water. Another interval at 8,770-82 ft. flowed at a daily rate of 75 bbl. of 21.4-gravity oil cutting 40 per cent. Texas Co. is regarding this well as a no-dope hole, but it is believed, however, that the above is approximately correct even though not officially released. The outlook for a new discovery is quite promising, even though the present wildcat has only shown realtively small production as it is believed there is a structural high to the north in which event the present wildcat, 1 Spencer in 1-4s-11w, would be an edge well along the south edge.

Test North of San Fernando Reservoir Delayed

Action was delayed this week by the Los Angeles City Council until a later date on an ordinance permitting Seaboard Oil Corp. to undertake the drilling of a wildcat north of San Fernando reservoir in the hills that adjoin the scene of California's first well. This wildcat area presents good possibilities and a number of operators have taken acreage for protection purposes. Attention was first focused on the area several years ago and again more recently. The city water department, in drilling a number of water wells adjacent to the area, encountered gas and oil seepages and some wells were abandoned. The seepages have become quite active again in recent months and geological work in the district indicate the possibility that a commercial accumulation may be expected around 3,000 ft. although this depth may vary one way or another. No action has yet been taken on a proposal made a few days ago by J. E. Elliott to undertake deep drilling in the Hancock Park district of Los Angeles city by means of a completely enclosed building 100 ft. in height and by the use of directional drilling to produce oil and gas from the Miocene.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: West. American Oil Co. 11 Ashton, 34-5s-11w, pumped 129 bbl., 28.2-gravity, 2 per cent cut, T.D. 4,368 ft., perf. 4,367-90 ft., 4,185-4,205 ft., completed in Ashton zone of Pliocene age.

Turnbull Canyon, Los Angeles County: Continental 2 Turnbull, 13-2s-11w, flowed 977 bbl., 26.9-gravity, 0.8 per cent cut, 370,000 cu. ft. gas, 31/64-in. bean, pressures 110/430 lb., T.D. 3,841 ft., completed in new zone, this is second well in field and is structurally higher than discovery well which was completed on the beam.

Wilmington, Los Angeles County: C. F. Dolley 1 Fulton, 33-4s-13w, pumped 145 bbl., 15.6-gravity, 5 per cent cut, T.D. 3,595 ft., gravel-packed perf. 2,620-2,700 ft., 2,750-2,930 ft., 3,170-3,595 ft., completed in Ranger zone.

Second Well Staked at Bowerbank, Kern County

Texas Co. has undoubtedly found a gas accumulation of commercial value in the Bowerbank section of Kern County because the company has located a new well to be drilled in 9-29s-24e. Texas has been working on wells in this area for the past several weeks and has completed two wells although no data has been made available with respect to the actual production. In addition to staking location for 18-9 Root mentioned above, the company has located 18-24 Kern County Land which will be drilled in 24-29s-24e. These two new wells, which will be drilled in search of commercial gas production, indicate quite clearly that the company has found a gas zone that shows excellent possibilities. The company recently finished 4-23 Bowerbank after plugging back the hole from 12,144 ft. to a redrilled depth of 4,945 ft. and perforating casing at 4,770-78 ft. This well was finished and shut in immediately subsequent to completion. It should be good for about 15,000,000 cu. ft. as the first completion in this district a few weeks ago looked rather good.

In the Helm district of Fresno County, General Petroleum Corp. resumed drilling operations in 75-33 Esperoad and is at present in the Eocene after getting a recovery of salt water on a test at 8,080-8,100 ft. Top of the Eocene was logged at 8,075 ft. Amerada Petroleum Corp. spent several days this week attempting to make a formation test of 5-27 Weyant in 27-16s-17e at Helm but the packers failed on two occasions and prevented a successful test. The company then started swabbing with the fluid level at 6,500 ft. but has had only minor showings to date. The interval being tested is at 7,485-80 ft. at which point some good showings were encountered. It is quite possible the well may kick over within the next day or so unless a bridge forms above the perforations. This is the second well drilled at Helm by Amerada since it discovered the field a few months ago.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Southeast, Fresno County: Standard 34-31-B fee, 31-19s-16e, flowed 1,648 bbl., 26.6-gravity, 0.5 per cent cut, 505,000 cu. ft. gas, 48/64-in. bean, pressures 500/750 lb., T.D. 8,185 ft., 60-mesh perf. 7,900-8,183 ft., green sand 7,770 ft., Gatchell oil sand of Eocene age 7,908-8,185 ft.

Coles Levee, Kern County: Ohio Oil Co. 20-F Kern County Land, 10-31s-25e, flowed 915 bbl., 32.6-gravity, 0.6 per cent cut, 753,000 cu. ft. gas, 48/64-in. bean, tubing pressure 275 lb., T.D. 9,774 ft., completed in Stevens oil sand of Miocene age 9,301-9,774 ft.

Greeley, Kern County: Superior 3 R. A. Moore, 12-29s-25e, flowed 1,620 bbl., 37.7-gravity, 0.4 per cent cut, 1,040,000 cu. ft. gas, 32/64-in. bean, tubing pressure 925 lb., T.D. 11,494 ft., 120-mesh perf. 11,460-94 ft., completed in Rio Bravo oil sand of Miocene age, 11,461-94 ft.

Jacalitos, Fresno County: Wilshire-Annex Oil Co. 41-26-E, 26-21s-15e, dry, T.D. 4,072 ft., perf. 3,991-4,002 ft., 4,010-45 ft., swabbed hole dry and after standing, fluid consisting of oil, mud, and emulsion rose 70 ft., top Temblor of Miocene age 3,980 ft., top Temblor oil sand 4,009 ft.

Kern River, Kern County: Westates Pet. Corp. 16 Cauley, 16-28s-27e, pumped 130 bbl., 12.6-gravity, 5 per cent cut, T.D. 2,700 ft., perf. 2,468-2,558 ft., 2,584-2,684 ft., completed in Tegeler oil sand of Pliocene age.

Mount Poso wildcat district, Kern County: Bush Oil

(Continued on Page 120)

OIL and GAS JOURNAL EDITION

BAASH ROSS News

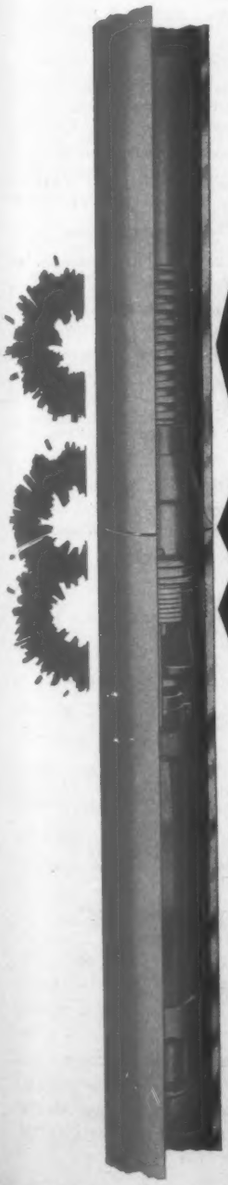
BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

A BULLETIN COVERING NEWS OF EQUIPMENT AND OPERATIONS IN THE PETROLEUM INDUSTRY

Salvage Work { THESE TWO TOOLS OFFER OPERATORS IMPORTANT ADVANTAGES IN MODERN SALVAGE OPERATIONS

Recovering Pipe From Old Wells Requires Equipment That Insures Minimum Damage

Today, with casing tubing and other equipment at a premium, salvage operations on old or abandoned wells are becoming increasingly important. Thousands of extra feet of usable pipe are thus being recovered by operators for use in their current development programs.



But in undertaking these operations there is an important point to remember...that in such salvage work, the generally weakened condition of the pipe being recovered makes the design and operating efficiency of the tools you use of even greater importance than ordinarily might be the case. Here it is *doubly* important

'Cushioned' FEED

that as little unnecessary strain as possible be put on the

KNIVES

SUPPORT

pipe... that the cut and recovery be made smoothly, quickly and efficiently without damage to the pipe and without risk of freezing the tools.

And there is an important reason why operators doing this type of work find that they get the job done better, faster—*at lower cost*—when they make the cut with the Baash-Ross Internal Casing Cutter and then recover the pipe with the Baash-Ross Rotary Releasing Spear...for these two tools embody certain engineering advantages that make them ideal for salvage operation use.

For example, notice in the Baash-Ross Casing Cutter how close the knives are to the anchoring slips. They are separated by only a few inches, whereas in many cutters the knives and slips are separated by as much as several *feet!*

By putting the knives as close to the slips as possible, B-R engineers have achieved more rigid support between tool and casing as the cut is made... thus insuring a faster, *smoother* cutting action and better all-around operating efficiency. This feature is particularly important when recovering pipe that has been pitted by corrosion, for the close-coupled, rigid support prevents chatter and wobble even though the surface is rough and pock-marked where the knives make their cut.

And here's another important point. See the square coil spring on the upper part of the body? Cutting weight is applied to the knives *through* this spring, cushioning out any vibration or roughness in the cutting action and insuring steady even feed at all times. Yet the feed can be instantly increased or decreased to meet changing requirements of the cut by merely regulating the weight!

Contrast this "cushioned" feed with the rough jarring feed that is apt to occur where the bare weight is applied directly to the knives and you see why this tool cuts ALL sizes of casing, tubing or drill pipe with smooth efficiency *regardless of their condition.*

One more time-saving advantage. With this cutter you can make *any* number of cuts on one run... a time and money-saving feature particularly important in salvage operations. If the pipe is stuck and you aren't sure where, you can start low, make a cut—and if this doesn't free you—move up the pipe in stages, making one cut after another until the pipe is freed... *all without coming out of the hole or wasting extra time!*

There are still other advantages built into this tool that will cut the cost of your salvage operations to the bone. Your nearest Baash-Ross representative has the full story and will be glad to show you how they fit into your particular salvage job. Let him help you.

(Leased in U.S.A.—Sold for export only)

FOUR PERFORMANCE POINTS THAT SIMPLIFY PIPE RECOVERY

For salvage work, here's the tool operators have found to be particularly efficient for recovering the pipe after the cut has been made... the **Baash-Ross Rotary Releasing Spear!** *Why?* There are four reasons, each of them vitally important...

MORE SLIP AREA

FLAT-BACKED SLIPS

ALIGNMENT COLLAR

- **First**—and most important—the slips are FLAT-backed and operate against a FLAT taper. This is one of the most valuable advancements ever built into a spear for, unlike round-backed slips that operate against a cone shaped taper, *flat*-backed slips are fully supported at all times—*regardless of their working position on the taper.* This eliminates danger of splitting the slips and jamming the tool under the heavy pulling strains encountered in salvage work... and insures *positive release* whenever desired!
- **Second**—the entire releasing mechanism in this tool is *below the slips—completely out of the way of all jarring and pulling strains.* That's why this Spear is instantly ready to release when necessary... a feature of great importance in all salvage work!
- **Third**—an "alignment collar" holds all of the slips in positive alignment as they grip the pipe, insuring a *uniform* grip that eliminates risk of splitting or damaging the pipe through concentrated slip pressure.
- **Fourth**—the pipe is further protected by the fact that the B-R Releasing Spear has greater effective slip area, reducing the per-unit pressure against the pipe. Not only are the slips *longer* for a better hold *up and down* the pipe, but they are also *wider* for a better grip *around* the pipe!

No matter how heavy the pull, the greater slip area of this Spear coupled with the positive alignment of the slips, insures maximum protection to the pipe you are trying to salvage. Add to this the important safety advantages of the *flat*-backed slips that will not split, nor jam, nor freeze under heavy pulling strains and you see why so many operators insist upon the Baash-Ross Releasing Spear for recovering pipe in all their salvage work!

(Leased in U.S.A.—Sold for export only)

A NEW CAMOUFLAGE PAINT has just been announced for use in concealing fuel storage tanks, refineries and other defense structures and equipment. It is available in seven colors—green, tan, black and four intermediate shades. All seven colors are reported difficult to see from the air and adequately meet the various requirements of good camouflage in any sort of terrain. In spite of the dark colors, the paint has exceptionally high heat-reflecting properties, throwing off most of the sun's rays that would normally be absorbed, it is claimed.

(No. 311)

A RADICALLY NEW TYPE *of luminous paint has recently been developed and is now available for use under "blackout" conditons. Unlike conventional luminous paints made of radio-active materials, this paint is said to be non-poisonous, retains its luminosity over long periods of time and does not require a protective covering. According to reports, it stands up under all types of weather conditions, can be applied to almost any material, including cement, canvas, wood and steel, and can even be immersed under water without damage. At least one large oil company is reported experimenting with it for use in protecting trucks, identifying valves and safety equipment in refineries, etc. Samples are available to companies for experimental purposes.*

(No.312)

BAASH-ROSS

For additional information on these items, send on a post card or letterhead your name, address and key number of items that interest you.

SOUTHWEST TEXAS

Wilcox Sand Test in De Witt County Logs Carrizo Gas

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Operators in Wilcox sand development in the Southwest Texas area centered their attention on Adams Oil & Gas Co. 1 Bercek, a wildcat located 3 miles east of the town of Yorktown in De Witt County. This well is approaching the Wilcox sand after coring gas sand at 7,075-82 ft., and at 7,119-29 ft. Another core at 7,129-48 ft. was logged in the Carrizo formation topped at 7,075 ft. The well is coring ahead below 7,222 ft., and the Wilcox is expected to be topped during the week. Tops of other geological markers are as follows: Hockleyensis 3,200 ft., Dibollensis 3,918 ft., Noncockfield 4,070 ft., Discorbis Yeguaensis 4,131 ft., Eponides Yeguaensis 4,240 ft., Operculina 4,928 ft., Weches 5,723 ft., and Cyclimina 6,210 ft.

Shield Oil Co. 1 Heard, approximately 2¾ miles southeast of the Heard field, Bee County, continues to log encouraging showings, and casing may be cemented for a production test at an early date. Drill-stem testing at 4,869-82 ft., and at 4,854-61 ft., tested a maximum of 565 lb. working pressure and some mud with a slight show of oil and gas, while another 15-minute test at 4,882-98 ft. tested 10 lb. working pressure, 90 ft. of oil and mud, 90 ft. of oil and salt water, and 2,520 ft. of salt water. At the end of the week the well was coring ahead in shale below 4,907 ft. A 13-minute drill-stem test the previous week at 3,927-37 ft. tested 600 lb. working pressure. Location is in the G. Roach Survey.

That's Why Hundreds More Crude Oil Treaters are Sylphon Equipped Each Year

Stop sludge formation. Don't risk damage from overheating. Keep oil temperatures exactly at the emulsion breakdown point, automatically, with simple, rugged, self-operating, Sylphon Regulators —built expressly for the service.

Designed to stand the gaff, with stainless steel trimmed valve, corrosion-resistant stainless steel bulb, armored connecting tubing, wide range of temperature adjustment.

Your oil treating equipment suppliers recommend it. Write for Bulletin DJ-20.

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KNOXVILLE, TENNESSEE
Representatives in All Principal Cities in U. S. A. and in Montreal, Canada and London, England

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Karnes County: Phillips 1 V. D. Strunk, dry, T.D. 8,514 ft.

Fields

Agua Dulce, Nueces County: Gulf Plains 1-B Texon Royalty Co., 62,000,000 cu. ft. gas and 85 bbl. distillate from upper sand and 40,000,000 cu. ft. gas and 68 bbl. distillate lower sand, open flow, perf. casing 6,272-6,300 ft., and 6,866-80 ft., T.D. 7,002 ft.
W. B. Osborn et al 1 E. Grove, 57,000,000 cu. ft. gas and 95 bbl. distillate, open flow, perf. casing 6,978-83 ft., T.D. 7,540 ft.

East Placedo, Victoria County: Stanolind 13 Vandenberg & Hill, 161 bbl., 8/64-in. choke, perf. casing 6,866-76 ft., T.D. 6,877 ft.

Greta, Refugio County: Shield 1 Heard, dry, T.D. 6,285 ft.

La Gloria, Brooks County: Magnolia 1 Young, 36,000,000 cu. ft. gas and 130 bbl. distillate from upper sand, 39,000,000 cu. ft. gas and 165 bbl. distillate from lower sand, open flow, perf. casing 5,745-90 ft., 5,830-70 ft., and 6,620-70 ft., T.D. 6,900 ft.

Odem, San Patricio County: Seaboard 2 Smith, 118 bbl., ⅛-in. choke, perf. casing 5,323-25 ft., T.D. 5,455 ft.
Seaboard 4 Smith, 95 bbl., ⅛-in. choke, perf. casing 6,750-58 ft., T.D. 7,517 ft.
Seaboard 4-B Welder, 163 bbl., ⅛-in. choke, perf. casing 5,427-37 ft., T.D. 5,445 ft.

Placedo, Victoria County: Magnolia 6 Henderson & Pickering, 132 bbl., ⅛-in. choke, perf. casing 6,027-31 ft., T.D. 6,032 ft.

Refugio, Refugio County: Hewitt & Dougherty 4 Reilly, 115 bbl., 9/64-in. choke, perf. casing 6,253-57 ft., T.D. 6,269 ft.

Seeligson, Jim Wells County: Shell 1 Seeligson, 144 bbl., 7/64-in. choke, sand 5,965-90 ft., T.D. 6,020 ft.
Transwestern 1-A Seeligson, 93 bbl., 5/64-in. choke, T.D. 5,990 ft.

South Caesar, Bee County: Tom Slick 1 J. J. Grissom, 127 bbl., ⅛-in. choke, perf. casing 6,552-57 ft., T.D. 7,134 ft.

LAREDO DISTRICT

Wildcats

Hidalgo County: Baldridge, King et al 1 Chapa, dry, T.D. 5,020 ft.

Webb County: O. W. Killam 1 Garcia, dry, T.D. 3,465 ft.

Fields

Alworth, Jim Hogg County: Purnell & Bateman 1, dry, T.D. 3,027 ft.

Colorado, Jim Hogg County: V. F. Neuhaus 5-G Neuhaus, dry, T.D. 2,862 ft.
Humble 54-B King, 106 bbl., ¼-in. choke, sand 2,971-80 ft.

Hoffman, Duval County: Magnolia 25 Weil, 55 bbl., pumping, sand 2,677-80 ft., T.D. 2,686 ft.

North Sun, Starr County: Sun 1 Garza, dry, T.D. 5,850 ft.

Oakville, Live Oak County: H. Coquat 1 Leroy New, 60 bbl., ¼-in. choke, T.D. 2,746 ft.

Sun, Starr County: Humble 2 Saenz, 76 bbl., 3/32-in. choke, sand 4,646-51 ft.

Yturria, Starr County: Sun 6-A Chapotal, 110 bbl., 9/64-in. choke, sand 2,227-42 ft., T.D. 4,242 ft.

White Creek, Live Oak County: Stelzig & Clark 1 Miller, dry, T.D. 1,866 ft.

SOUTH CENTRAL TEXAS DISTRICT

Wildcats

Bastrop County: Pagenkophf 1 Ella Bell, dry, T.D. 3,150 ft.

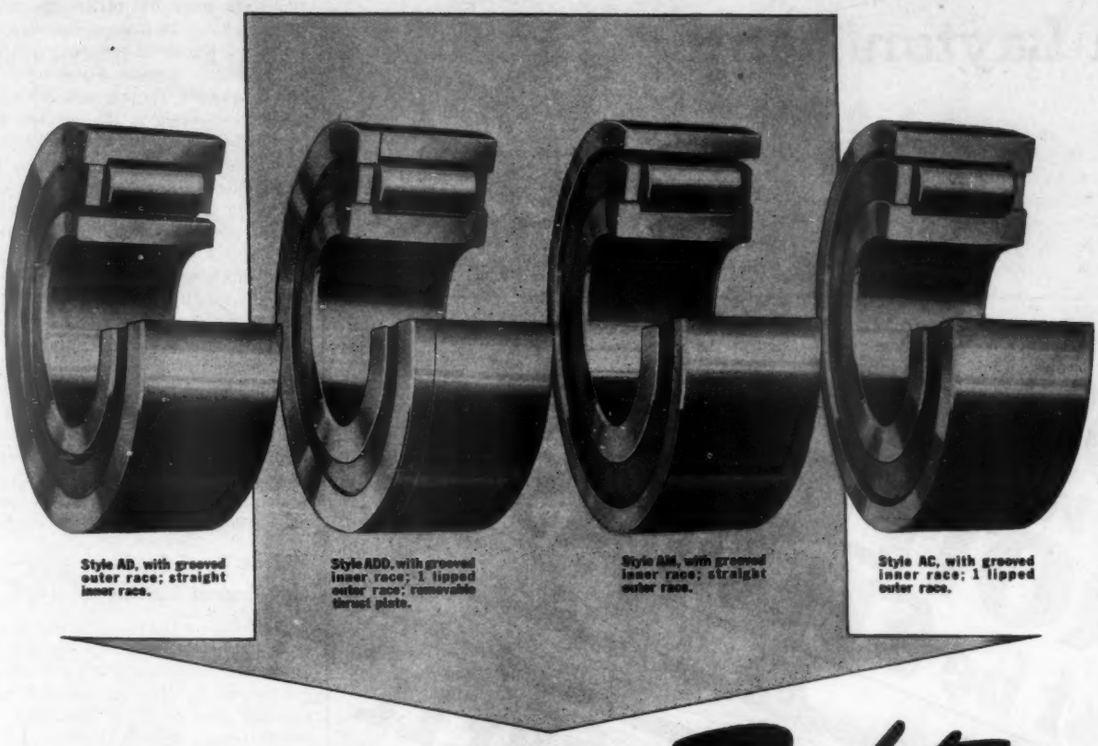
Fields

Bee Creek, Caldwell County: Ralph Ogden, 12-B Miears, dry, T.D. 2,421 ft.

New Distillate Field Near Orange Grove

Plymouth Oil Co. was opening a new gas-distillate field 1 mile southeast of the Orange Grove field, Jim Wells County, as 1 Kuck was flowing

(Continued on Page 108)


Style AD, with grooved outer race; straight inner race.
Style ADD, with grooved inner race; 1 lipped outer race; removable thrust plate.
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AMERICAN *HEAVY DUTY* **ROLLER BEARINGS**

OKLAHOMA FIELD REPORT

Nemaha Ridge Wildcat Flows From Layton Sand

By CARL HOOT

HIGHLIGHTS of Oklahoma development during the week were the discovery of a rich gas pay east of the Laffoon field in Lincoln County and the finding of oil in the Layton on a Nemaha granite ridge test between Crescent and Edmond. On the negative side of the ledger was the ordered abandonment of Texas' wildcat 12 miles southeast of Apache and on the same trend.

Cities Service 1 Babcock, SE NE NE 10-15-4w, Logan County, was shut in for tanks after flowing 388 bbl. of 42-gravity oil in 11 hours. The well was drilled to 6,800 ft. but on drill-stem test made 300 ft. of fluid which was 95 per cent water and mud. It was then plugged back and on testing the Layton at 5,016-5,115 ft. made 500 ft. of oil and 500 ft. of water.

Fields have been found along the Nemaha granite ridge from El Dorado, Kans., almost to the Arbuckle Mountains. Some of the Oklahoma ridge fields are small but others are among the largest in the state, including Garber, Oklahoma City, Crescent, Edmond, and Moore. Three gaps occur in the nearly regular sequence of fields of which one is between Thomas and the small Barnes pool in Garfield County, the second is a 19-mile gap between Crescent and Edmond in Logan and Oklahoma counties, and the third is between Moore and Noble in Cleveland County.

East of the granite ridge are there are a number of pools on radial lines, somewhat like the spokes of a wheel of which the granite ridge is the rim. Where these spokes intersect the rim, there is usually a pool. One spoke containing the Meridian and Seward pools has no pool on its intersection with the rim and the Cities Service Babcock well may be the discovery of this field. Finding the Wilcox dry and the Layton sand productive was the experience of Crescent operators who later found good Wilcox production higher on the structure. The Babcock test may thus be a pool opener to a pool of the order of Crescent, a possibility that is of great interest in these days of declining production for Oklahoma.

Wilcox Sand Produces Gas East of Laffoon

The Laffoon field in southeastern Lincoln County is unique in that is produces a very heavy asphaltic oil from the Wilcox. It also has a prolific gas pay in the Hunton. About 4 miles east of the Laffoon field, and in Okfuskee County, A. J. Peters (Southwestern Gas Co.) 1 Brown, SE NW NE 7-13-7, 4 miles east of the Laffoon field, made an estimated 25,000,000 cu. ft. of gas after setting 7-in. at 4,077 ft. The well was acidized with 3,000 gal. Rock pressure was 1,500 lb.

Wildcats in Southern Sector Discouraging

Texas Co. 1 Reich, Comanche County wildcat, C NW NW NE 25-4-11w, made final swabbing tests and will be plugged. Drilled to 3,493 ft. in the lower Simpson, the well was plugged back to 2,485 ft. Five-inch casing was set at 2,414 ft. After swabbing to bottom and being shut in overnight, additional swabbing recovered 10 bbl. of fresh water and 2 bbl. of oil.

Ray Stephens, Inc., 1-A Johnston, NE NE NW 18-5-8w, of Grady County, about 1 mile east of the Cement pool, was shut down waiting orders after recovering 2,000 ft. of salt water on drill-stem test in 30 minutes. Packer was set at 4,343 ft.

Seminole County Wildcats Show Oil

In Seminole County, C. A. Palmer et al 1 Humphrey, SW NW NE 15-6-5, between Traugh and Konawa, found oil in the lower Allen at 2,862-42 ft. After setting 5½-in. at 2,855 ft. the well was cleaned out and swabbed 163 bbl. oil and 4 bbl. water, then pumped 120 bbl., was shot with 100 qt. at 2,830-39 ft., swabbed and flowed 195 bbl. in 9 hours while cleaning out. The well decreased steadily on swabbing tests to 60 bbl. per day and was put on the pump.

Also in Seminole County, Cities Service and Atlantic 1 Fort Cobb, SW NE NE 4-8-6, northeast of Mission, was drilling ahead at 5,290 ft. after getting 130 ft. of gas-cut mud in a 30-minute drill-stem test from 5,217-31 ft. Previously, a drill-stem test at 4,771-85 ft. recovered 1,670 ft. of oil and 500,000 cu. ft. of gas. The oil tested 33.8 gravity with the base of pay at 4,802 ft.

Good Gas Well Found East of Sporn

In Lincoln County, Fred Haddock et al 1 Hert,

NOW as never before, our PROTECTION must be STEADFAST

HILL-HUBBELL PIPE PROTECTION is DEPENDABLE

BUY STEEL PIPE

Machine Coated-and-Wrapped at any of these mills:

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National Tube Company
Republic Steel Corporation
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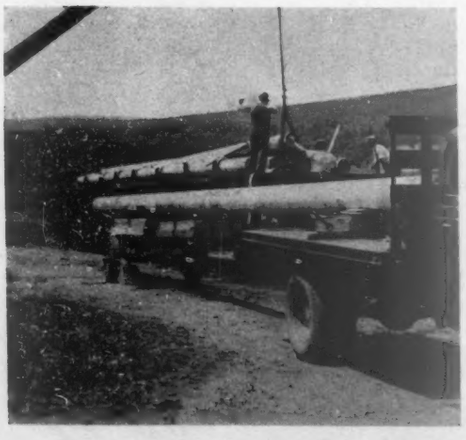

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SPANG & COMPANY, Butler, Pa.

SW NE SE 22-17-3, an east outpost to the Sporn field, flowed 35 bbl. of oil and gaged 2,500,000 cu. ft. of gas with 1,700 lb. rock pressure. Main pay was from the Wilcox at 4,538 ft.

Jones et al 1 Lockhart, SW NW SE 7-14-4, a wildcat north of the Chandler pool in Lincoln County, was drilling to the second Wilcox at 5,070 ft. after finding water in the first Wilcox at 5,051 ft.

OKLAHOMA COMPLETIONS

Wildcats

Comanche County: Texas 1 Reich, NW NW NE 25-4-11w, dry, T.D. 3,493 ft., in lower Simpson, P.B. to 2,485 ft., with show of oil.

Hughes County: Hendow, Inc., 1 Brown, NE SW SE 25-8-8, abandoned location.

Kay County: Helmerich & Payne 1 Kreger, SE SE NE 4-25-2w, dry, T.D. 4,781 ft., Hoover sand 2,195-2,215 ft., Oswego 3,950-95 ft., McLish 4,399 ft., Woodford 4,674 ft., Viola 4,740 ft., Wilcox 4,754-81 ft.

Osage County: Marshall 1 Strozier, SE SW SE 21-22-9, dry, T.D. 2,785 ft., Oswego 1,815 ft., lime 1,875-85 ft., sand 1,895 ft., Bartlesville 2,152 ft. with show of oil, Wilcox 2,642-2,730 ft., Arbuckle 2,730-85 ft

Payne County: H. L. Berkey 1 Frick, S½ SW NW 33-19-2, dry, T.D. 4,874 ft., Hogshooter 3,375 ft., Checkerboard 3,640 ft., Oswego 3,870 ft., Woodford 4,575 ft., Misener 4,607-12 ft., Hunton 4,612 ft., Viola 4,715 ft., Wilcox 4,783-89 ft.

Seminole County: Donmar Oil 1 Ashby, NW cor. 32-8-6, dry, T.D. 4,558 ft., Hogshooter 1,640 ft., Dense 1,710 ft., Checkerboard 2,035 ft., Senora lime 2,825 ft., Earlsboro 3,080 ft., Woodford 4,100 ft., Hunton 4,249 ft., Sylvan 4,256 ft., Viola 4,315 ft., dolomite 4,384 ft., Wilcox 4,420 ft., second Wilcox 4,521 ft

Fields

Byars, McClain County: Patsy Oil & Gas 5 Caldwell, E½ SW SE 15-5-3, dry, T.D. 4,035 ft.

Cumberland, Marshall County: Pure Oil 1 Thomas-102 SW NE NW 28-5s-7, old T.D. 5,162 ft., 7-in. 4,975 ft., T.D. 5,716 ft., flowed 132 bbl. from McLish lime 5,196 ft.

Hobart, Kiowa County: Argo 1 Ratliff, SE NE 19-7-17w, pumped 9 bbl., Sylvan dolomite 1,315 ft., T.D. 1,566 ft.

Guthrie, Logan County: Sunray 8 Donaghue, SW SE SE 7-17-1w, dry, T.D. 5,438 ft.

Hazel, Seminole County: Wood Oil 3 Tobin, NE SW NW 22-7-5, pumped 65 bbl., dolomite 4,082-4,154 ft.

Hazlett, Pawnee County: Johnson 2-A Eichelberger, NE SW 10-20-7, gaged 1,000,000 cu. ft. gas from Bartlesville 2,653-56 ft.

Cement, Caddo County: English Drilling 3 Rigney, SW NW NW 12-5-9w, deepened from 3,179 to 4,756 ft., gaged 25,000,000 cu. ft. gas from sand at 4,480-4,500 ft., R.P. 1,800 lb.

Knox, Grady County: John 5 Graham, SW SW SE 27-3-5w, old T.D. 1,463 ft., deepened to 1,550 ft., no increase, pumepd 10 bbl.

John 2 Cochran, SW SW SE 27-3-5w, deepened from 1,677 to 1,695 ft., no increase, pumped 30 bbl.

Lawton, Comanche County: W. J. Price 1 Japp, NE SW SW 34-2-11w, dry, T.D. 1,015 ft.

Oklahoma City, Oklahoma County: Clark & Co. 1 Hillman-Payne, NE SW SW 15-11-3w, dry, T.D. 6,602 ft.

British American 2 McNab, NW SE NE 22-12-3w, deepened from 6,494 ft. to 6,504 ft., shot and pumped 64 bbl.

British American 6 McNab, NW SE NE 22-12-3w, deepened from 6,455 ft. to 6,515 ft., dry.

C. C. Peppers 1 Block 43, SE SW NW 34-12-3w, pumped 404 bbl., Wilcox 6,463-6,540 ft.

Phillips 1 Wepaco, SE SW SE 34-12-3w, reworked, pumped 657 bbl. from 6,450-6,503 ft.

Robertson, Gravin County: W. A. Delaney 1 Bates, SW cor. 29-1-3w, pumped 100 bbl. oil and 100 bbl. water from sand at 3,322-60 ft., T.D. 3,390 ft.

Scholem-Alechem, Carter County: W. A. Delaney, Jr., 1-A Pollack, C NE NE 8-1s-3w, dry, T.D. 2,960 ft.

St. Louis, Pottawatomie County: Hilton Phillips 4 Bettis, SE SW SW 21-7-4, P.B. from 4,300 ft. to 4,280 ft., ripped casing in dolomite 4,162-82 ft., pumped 62 bbl.

North St. Louis, Pottawatomie County: Ohio Oil 2 Welfelt, NE NW NW 34-8-4, dry, T.D. 3,908 ft.

(Continued on Page 110)

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Southwest Texas Fields

(Continued from Page 104)

gas with a slight spray of oil while testing through a 7/64-in. choke from perforated casing opposite sand at 3,671-77 ft. Tubing pressure was 475 lb. This well was drilled to a total depth of 5,828 ft., and while some sand was logged in the 5,200-ft. horizon, the well apparently has no relation with the Orange Grove field.

In the same county, Magnolia 28 Seeligson, a northwest outpost in the Seeligson field, is drilling in shale below 6,705 ft., and prospects of opening another major extension to this structure were not encouraging. An electrical survey made at 5,800 ft. showed the well to be 105 ft. structurally lower than the company's 14 Seeligson, the nearest producer. Production in the field proper is from several sands at intervals from 5,200-5,900 ft.

Second Wilcox Well at Washburn

Another Wilcox sand producer was assured the Washburn field, La Salle County, as Quintana 7 South Texas Syndicate tested 1,000 ft. of pipeline oil on a 32-minute drill-stem test at 5,148-67 ft. and the well is coring in shale below 5,490 ft. The sand correlates about normal with the upper sand that has been logged in other well, and the main 5,500-ft. sand was expected to be topped before the end of the week. In the meantime, the company's 8 South Texas Syndicate, 1,400 ft. northwest of the discovery well was coring in shale below 5,275 ft. and no shows of oil or gas have been reported.

In the new McLean field, Webb County, Magnolia 1 McLean, an offset to the discovery well is being rigged up to pump after it failed to flow from sand at 3,251-56 ft. Drill-stem testing the previous week recovered 1,850 ft. of pipe oil. O. W. Killam 3 McLean is standing cemented with 5½-in. casing at 3,257 ft., the total depth. The regular pay was cored at 3,226-36 ft.

In the same county, but located 8 miles west of the Glen field, O'Neill, Bedwell et al 1 A. M. Bruni is bottomed at 1,584 ft., and the operators are waiting on casing which will be cemented to test sand at 1,576-83 ft. The sand is reported to have carried an odor of oil, but a 60-minute drill-stem test recovered only 200 ft. of drilling mud.

Along the Balcones fault line district, and located in the Pendencia field area, Wellington 2-B Sullivan, is flowing an unestimated amount of dry gas while testing through a ⅛-in. choke. The well was drilled to the Navarro sand, and was completed through perforated casing at 1,888-95 ft.

Shallow Sand Shows Oil in Cooke County Near Muenster

By D. H. STORMONT

WICHITA FALLS, Tex.—The possibility of a new shallow-sand oil-producing area for northwestern Cooke County was reported this week at Panhandle Refining Co. 1 J. I. Welch, M. W. Ross Survey, 6 miles north of Muenster. At total depth of 1,932 ft., operator ran an electrical survey and then plugged back to 1,305 ft. Seven-inch casing was set at 1,275 ft. to test a sand section, from 1,275-1,305 ft., which showed oil.

Two Clay County Sectors Active

Two oil-producing areas in Clay County were active during the week and, as a result, one, the New York City Mississippi lime pool, may receive a new shallow-sand pay horizon. Deep Oil Development Co. 1 Hapgood, J. Walker Survey, failed to find Mississippi lime on the southeast edge of the pool, thereby defining that side of the field. However, opposite a section of the Strawn sand. operator perforated casing and hole filled 300 ft. with fluid. Perforations were from 4,911-24 ft. Operator then swabbed the test, recovering 20 bbl. of oil and 20 bbl. of water in 4 hours. At last report, pump was being installed.

Also in Clay County, the Worsham field has been assured a slight west extension. Gulf 6 Worsham, Section 37, Block 4, H.&T.C. Survey, has set 7-in. casing at 5,506 ft., total depth, for completion tests in the Bend conglomerate.

The test topped the Bend at 5,482 ft. and in a core from 5,485-5,506 ft. recovered 2½ ft. of lime with strong oil odor. Electrical survey made on the test also revealed tight oil sand from 3,812-68 ft. and 5,281-98 ft. in the Strawn sand.

Six Wildcats Find Oil Shows

Wildcatting activity which has been rather slow for the past weeks showed a marked increase this week as six wildcats in five counties reported finding oil shows. Two of the wildcats were in Archer County and the other four were in Jack, Grayson, Foard, and Wilbarger counties.

One of the two tests in Archer County is Sinclair Prairie 1 Coleman, Brazos C.S.L. Survey, which is preparing to make completion tests. Hole is bottomed at 5,890 ft. and casing has been set at 5,292 ft. on top of the Caddo lime. A show in that formation will be tested.

The other Archer County wildcat is Continental 1 Ferguson, Section 1, S. P. Survey, 3 miles southwest of Holliday. No. 1 Ferguson is preparing to make a drill-stem test after a core taken from 5,073-84 ft. returned lime with oil saturation.

In Jack County, Wilcox Oil & Gas Co. 1 Bloodworth, McDonald Survey, early in the week recovered 60 ft. of oil and gas-cut mud on a 30-minute drill-stem test from 3,810-3,900 ft. in the Bryson sand. No. 1 Bloodworth is contracted to 6,000 ft. and is drilling on toward that depth.

A slight oil show was logged by R. W. Talbot at 1 Jewell, Grayson County wildcat. The wildcat found the show of oil in a hard sand at 7,350-72 ft. Operator continued to drill below 7,459 ft.

Casing was perforated for a third time at Bruce Sullivan 1 McCoy, Seaton Survey, 4 miles south of Crowell, in Foard County, without increasing the oil production. Previously, operator had perforated casing from 5,580-86 ft. and swabbed 1 bbl. of oil hourly. This week operator perforated casing from 5,536-42 ft. with no increase in oil and at last report had shut down.

Consolidated Oil Co. 1-D Potts, H.&T.C. Survey, Wilbarger County wildcat, 2½ miles south of the Consolidated pool, recovered 60 ft. of mud with a slight show of oil on a 30-minute drill-stem test from 4,212-42 ft. The wildcat logged the top of the lower Caddo series at 4,212 ft. and, after the drill-stem test, continued to drill ahead.

NORTH TEXAS COMPLETIONS

Wildcats

Clay County: Harry B. Wallace 1 Dallas Joint Land Bank, Y. Duncan Sur., A-112, dry, Fusulina 1,090-1,100 ft., T.D. 1,351 ft.

Akin, Dinock & Costley 2 R. E. Huff, J. Bradshaw Sur., A-17, dry, T.D. 1,190 ft.

Superior 1-A G. M. Scaby, Sec. 2, D. A. Blake Sur. A-88w, dry, Caddo 5,379 ft., Barnett 5,628 ft., Mississippian 5,740 ft., Ellenburger 5,810 ft., T.D. 5,865 ft.

Fields

Antelope, Clay County: Shell 4 L. S. Wright, Sec. 2625, T.P.&L. Sur., flowed 40 bbl. in 4 hr., est. 100 bbl., pay 3,160-80 ft.

K.M.A., Wichita County: Falls Refining 2 J. B. Tidwell, W. H. Spellus Sur., A-257, pumped 10 bbl. in 1 hr., Ellenburger 4,383 ft., acid 4,386-91 ft.

Ross, Clay County: Continental, Superior, and Dillard 1 H. R. Ditlanet, Jesse Massey Sur., A-321, flowed 73 bbl. in 6 hr. through ¾-in. choke, est. 200 bbl., Caddo 5,378 ft., acid 5,416-90 ft., T.D. 5,490 ft.

Throckmorton, Throckmorton County: F. G. Lippitt 2 R. W. Kelly, Sec. 2, Comanche Indian Reservation Sur., pumped 29 bbl., pay 692-710 ft.

Voth, Cooke County: H. E. De Tee 10 B. C. Rosson,

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B.B.B.&C. Sur., A-146, pumped 25 bbl., pay 1,101-09 ft.

Miscellaneous

Wichita County: Hanlon-Buchanan 13-2 T. L. Burnett, Sec. 34, H.&G.M. Sur., A-435, old well, pumped 9 bbl., pay 702-12 ft.

Young County: Cable Drilling 47 S. E. Snider, R. Wilson Sur., A-1276, pumped 6 bbl., pay 595-605 ft.

S. O. Ewing and Homer Thompson 2 John Courtney, Sec. 1394, T.E.&L. Sur., pumped 3 bbl., pay 832-36 ft.

Charles B. King 1 F. C. Dailey, S. Tynes Sur., A-274, dry, T.D. 520 ft.

Sieboldt Drilling 1 E. M. Wolfe, Sec. 623, T.E.&L. Sur., old well, dry, Marble Falls 5,266 ft., T.D. 4,503 ft.

W. E. Production 1 J. J. Crubbs, Sec. 647, T.E.&L. Sur., old well, dry, T.D. 4,372 ft.

NEW WILDCAT LOCATIONS

Clay County: Dudley, Fisher & Kahn 1 W. A. Henderson, 960 ft. from N and 900 ft. from E lines S. Hernandez Sur., A-185.

Bridwell Oil Co. 3 W. H. Myers, 5,040 ft. from W and 5,450 ft. from S lines Carlton C.S.L. Sur.

Montague County: Sinclair 1 M. Sanders, SW SW Sec. 114, J. C. Mattison Sur., A-471.

Sinclair 1 J. A. Fooshee, NW NW Sec. 135, J. C. Mattison Sur., A-471.

Wichita County: O. H. Hammer 1 P. W. Handlton estate, 660 ft. from S and W lines N½ Sec. 22, H.&T.C. Sur., Blk. 7.

New Gas Zone Found at Wimberly

FORT WORTH, Tex.—Gas production was showing last week from a new zone in the Wimberly pool of Jones County. Butler & Horne Drilling Co. 1 O. J. Fikes, 330 ft. out of the northeast corner of south half De Witt County School Lands Survey 105, gaged 14,300,000 cu. ft. of gas at 260 lb. working pressure after treatment with 3,000 gal. of acid at 2,361-75 ft.

Before the well was acidized it had a show of oil from the Gunsight lime topped at 2,525 ft., and from the lower Hope lime which was passed earlier in the week. Successful completion in the new horizon would open the sixth pay zone for the pool.

Acid treatment of an offset, R. L. Foree 1 Fikes, resulted in a flow of about 40 bbl. an hour with 600 lb. of pressure on casing. Treatment was at 2,280-2,305 ft. Butler & Horne 4-A Wimberly, a north extension to the pool, was plugged back from 2,571 ft. to test a showing from 2,472-91 ft

Discovery Well Gaged

Taylor County's new pool opener, C. W. and William L. Snoddy 1 D. L. Tipton, reported production of 300 bbl. of oil in 11 hours after it had been treated with 2,000 gal. of acid. Flow was through 2-in. tubing from Flippin lime at 2,771 ft. An official gage was to be taken during the week.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Coleman County: Cooper Brothers et al 1 Mrs. M. E. McClure, T. B. Frizzell Sur. 711, dry, T.D. 92(ft. in sand.

Nolan County: J. E. Farrell 1 C. W. Tipton, Sec. 43. T.&P.R.R. Co. Sur., Blk. 19, dry, T.D. 5,202 ft. in shale.

Runnels County: A. J. Johnson 1 Bert Fletcher, E. W. Bull Sur. 333, old well, T.D. 715 ft., dry.

Fields

Desemonia, Eastland County: T. G. Jackson 3 J. W. Taylor, S. C. Rankin Sur., pumped 10 bbl., acid 3,425-75 ft., T.D. 3,475 ft.

Hawley, Jones County: T. D. Humphrey 10 H. Dorsey estate, Lot 18, M. Bueno Sur. 196, old well, T.D 2,246 ft., pumped 201 bbl. oil and 68 bbl. water.

McMillian, Runnels County: Hightower Oil & Refining 1 D. L. Brevard-A, Lot 21, N. Travis Sur. 533, o well, acid 3,526-68 ft., pumped 10 bbl., T.D. 3,568 ft., *discovery of new pay zone.*

Southwest McMillian, Runnels County: Art Tucker 1 W. B. Dankworth, Lot 52, D. Diaz Sur. 532, flowed 63 bbl. oil and 18 bbl. water, oil sand 2,293-2,31 ft., T.D. 2,310 ft.

Novice, Coleman County: T. S. Schroeder et al 1 J. M. Barnett, Sec. 21, T.&N.O.R. Sur., Blk. 2, dry, T D. 3,742 ft. in shale.

States Oil Corp. 2 R. T. Goodson-B, Sec. 23, T.&N. O.R. Sur., Blk. 2, pumped 25 bbl., shot 3,630-50 ft., T.D. 3,652 ft.

Wimberly, Jones County: Fain-McGaha Oil 1 David Tarpley, Lot 104, Godwin subd. of De Witt C.S.L. Sur. 126, flowed 187 bbl. natural in 4 hr. through ¾-in. choke on tubing, est. 700 bbl., lime 2,325-35 ft., T.D. 2,335 ft.

Miscellaneous

Brown County: D. H. Brock et al 1 H. D. Moore, 600 ft. from S and 900 ft. from E of Lot 21, Charles Messer Sur. 127, dry, Caddo lime 795 ft., T.D. 1,185 ft.

Callahan County: H. L. Mikeworth 1 E. L. Finley, 750 ft. from N and 450 ft. from E of NW Sec. 16. D.&D.A. Sur., dry, T.D. 757 ft.

Virgil Wagley 1 R. W. Bennett, 150 ft. from S and E of Bennett farm in Abe L. Eaves Sur. 757, T.D. 626 ft.

NEW WILDCAT LOCATIONS

Brown County: M. W. Walker 1 M. H. Hill, 660 ft. from N and E lines, S. P. Walker Sur.

Comanche County: A. H. Woodfin 1 W. A. Pettit, 700 ft. from W and 200 ft. from N lines of SW cor. S. C. Robertson Sur., A-813, old well to be deepened to 3,500 ft., old T.D. 3,275 ft.

Shackelford County, semiwildcat: Kittery Oil Co. 1 J. H. Elliott, 660 ft. from N and E lines of SW¼ Sec. 9, L.A.L. Sur., also 1,320 ft. from N of Roark 1-B Elliott, 3,000-ft. test.

Taylor County, semiwildcat: J. C. Hunter 1 J. C. High, 660 ft. from S and W lines of NW¼ Sec. 8, L.A.L. Sur., 3,350-ft. rotary test.

Oklahoma Fields

(Continued from Page 108)

Tipton, Jackson County: Kerbow-Britton 3 Leona, SE SW SE 31-1-19w, pumped 10 bbl., granite wash 2,562-2,650 ft., T.D. 2,660 ft.

Weleetka, Okfuskee County: Homer Bryant 1 Johnson, SW NE SE 24-10-11, pumped 12 bbl. from sand 1,981-98 ft., T.D. 2,002 ft.

Miscellaneous

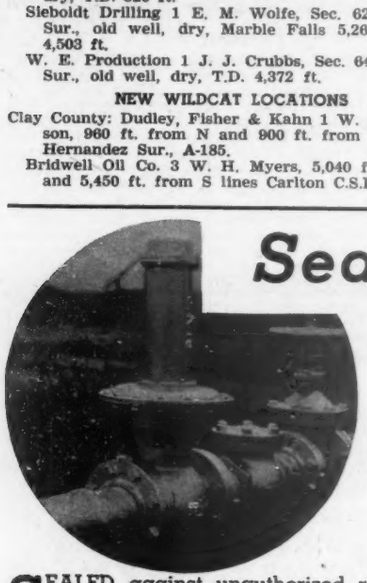
Creek County: Sinclair Prairie 2 Bell, NW SW SE 20-16-8, a western extension to the Mercer pool, pumped 20 bbl. from 3,764-3,822 ft., T.T. 3,845 ft., Prue 2,502-49 ft., Bartlesville 3,005-55 ft., Wilcox 3,800-45 ft.

Garfield County: Phillips 1 Lydie, NW NE NW 36-21-3w, flowed 438 bbl. in 17½ hr. through open tubing, Wilcox 5,442 ft., T.D. 5,569 ft.

Okfuskee County: Deep Rock 1 Chastain, SE NW SW 7-11-8, dry, T.D. 3,693 ft.

Pittsburg County: J. E. Weible 3 Smith, SE SW SE 32-9-16, dry, T.D. 900 ft.

Public Service 1 Thomas, SW NW NW 10-4-16, gaged 2,000,000 cu. ft. gas from Hartshorne sand 1,203-1,350 ft., T.D. 1,400 ft., R.P. 485 lb.



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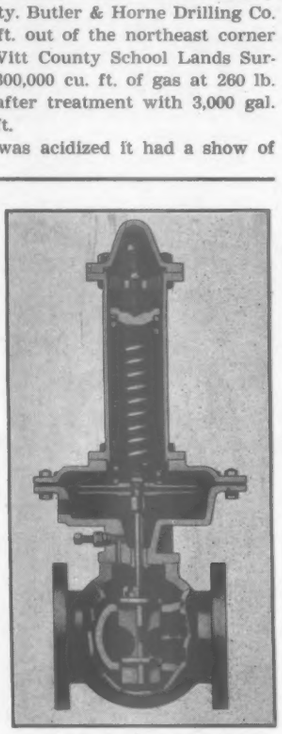

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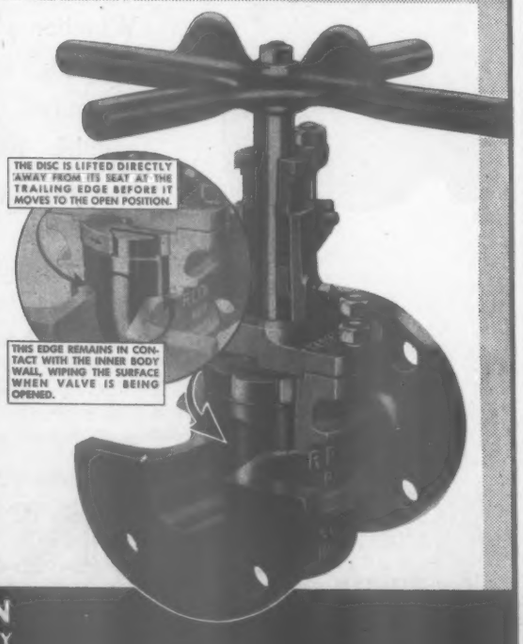
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Reed City Development Continues at High Rate

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Despite federal production and drilling restrictions, the Osceola County Reed City field continued last week at a high rate of development, five new wells being completed. However, as the field nears drill-up period, well production shows greater variation, those completed during the past week ranging from one with initial potential of 8,160 bbl. a day to another flowing by heads at a rate of 64 bbl. for the first 17 hours.

January production from the Reed City field and the newer Headquarters field in Roscommon County was largely responsible for the 1,617,000 bbl. of crude produced in Michigan. The Oil and Gas Association of Michigan announced daily average was 52,177 bbl. compared with 56,583 bbl. in December. While the figure is higher than the federal proration quota, that is believed due largely to the continued completion of heavy producers in those two fields. Biggest production decline last month was 1,800 bbl. a day in the Clare-Winterfield pool, Clare's Freeman-Redding field dropped off 750 bbl. a day and the decline was around 400 bbl. a day in the Kent-Ottawa and Van Buren County areas.

Among current field operations, oil men were watching a wildcat test in Section 35, Colfax Township, Wexford County, near Cadillac. The well, Shakespeare et al 1 Cadillac was drilling below 3,750 ft. having reached the Dundee. Operators planned to continue into the Monroe formation if there is no oil in the Dundee.

There were 14 completions last week, including 6 dry holes, 4 in Allegan County, the others being wildcat tests in Clinton and Van Buren counties.

The decline in new operations continued, however, with only nine drilling permits being issued by the state Conservation Department. Bringing the total for the year to 59, the permits are for two tests in Osceola County and others in Allegan, Bay, Clinton, Kent, Montcalm, Lake, and Van Buren.

MICHIGAN PRODUCTION REPORT

Daily Averages for January 1942, and December 1941

Field—	Jan.	Dec.
Porter-Yost	4,032	3,955
Greendale-Chippewa	1,034	1,119
Sherman-Isabella	557	630
Vernon-Leaton-Denver	743	648
Wise-Isabella	693	830
Reed City	19,291	18,310
Lincoln-Clare	29	131
Freeman-Redding	3,201	3,682
Winterfield-Clare	3,360	5,151
Beaverton-Grout	390	740
Buckeye	1,448	1,486
Edenville	138	145
Bentley	254	241
Genesee County	4	0
Ogemaw County	902	1,153
Clayton-Arenac	476	566
Monitor-Bay County	471	502
Kawkawlin-Bay County	606	638
Roscommon County	3,338	3,237
Saginaw City	44	48
Birch Run	20	30
Dundee-Monroe	228	221
Crystal-Wyman	299	258
Amble-Montcalm	34	38
Muskegon	23	21
Holland-Zeeland	9	13
Allegan County	3,484	4,263
Walker-Wyming-Talmadge	2,429	2,857
Barry County	0	7
Tuscola-Wisner	83	112
Total	52,177	56,583

MICHIGAN COMPLETIONS

Allegan County, Allegan Township: Bridger Basin Oil Corp. 1 Armintrout, communitized, NE SW SW 34-2n-13w, wildcat, dry, T.D. 1,409 ft.

Cheshire Township: Walter A. Young and Stephen F. Clark 1 Merriam, SW SE SE 35-1n-14w, dry, T.D. 1,310 ft.

Earl H. Grover 1 Barnard, SW SE NE 33-1n-14w, wildcat with show of oil completed dry, T.D. 1,292 ft.

Hopkins Township: Andrew S. Hoyt, agent, 1 Knorr, SW SW SW 18-3n-12w, dry, T.D. 1,616 ft.

Frank S. Vahue 1 Beligraph, SE NW NW Sec. 7, location abandoned.

Trowbridge Township: John F. Burton 1-A Waterman, NE NE NE 31-1n-13w, pumping 45 bbl., acidized, T.D. 1,355 ft.

Bay County, Monitor Township: Chapman Oil Co. 5 Reichsteiner, SW SE NE 3-14n-4e, 100 bbl., acidized, T.D. 2,920 ft.

Clinton County, Dallas Township: John B. Spitzley, trustee, 1 Simon, NW SE SE 21-7n-4w, wildcat, dry, T.D. 2,934 ft.

(Continued on Page 129)

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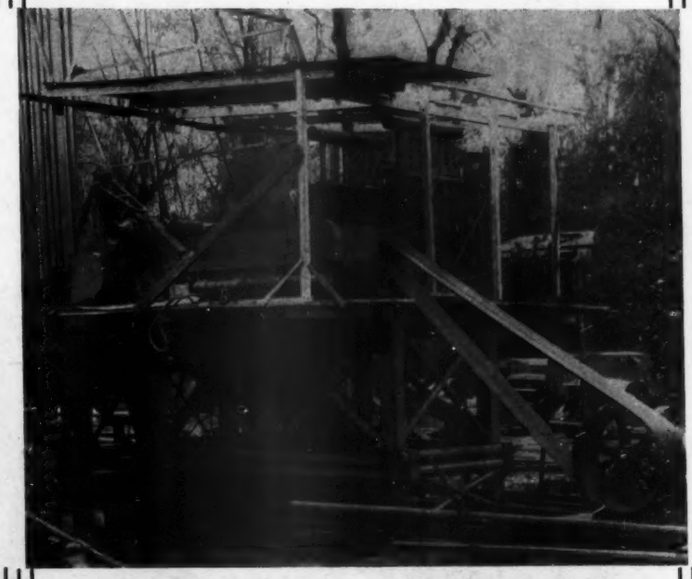

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Showings Found in Yegua in Harris County Wildcat

By F. L. SINGLETON

HOUSTON, Tex.—George Strake 1 Phoenix Dairy, a wildcat located about 15 miles north of Houston, Harris County, was attracting considerable attention at the close of the week as it cores ahead below 7,234 ft. Several cores at intervals from 6,690-7,210 ft. recovered sand and shale with an oil and gas odor. The well topped the Heterostegina at 3,394 ft., Textularia Warreni at 5,013 ft., Hockleyensis at 5,634 ft., Cockfield at 6,584 ft., Discorbis Yegua at 6,652 ft., and the Eponides Yegua at 6,780 ft. The well is located in the Peter Craft Survey, and is on strike with the Bammel, Fairbanks and North Houston fields, all of which produce from the Cockfield and Yegua formation.

Magnolia Outpost Testing

An attempt was being made to extend Wilcox sand production in the Magnolia field, Montgomery County, 1 mile southwest as Glenn McCarthy prepared to test 1 H. T. Tucker. Total depth of the well is 10,017 ft., with 5½-in. casing cemented on bottom. Details as to where the well will be tested were not available, but it is assumed that showings were logged at the 9,800-10,000-ft. interval, and if a test of the section fails, it will be plugged back and completed in the 8,400-ft. sand from which the discovery well was completed last year as a gas-distillate producer.

Midway between the Chenango and Anchor fields, Brazoria County, Stanolind 1 Murchison was being prepared for a production test after cementing casing at 10,050 ft. Total depth is 10,497 ft. The well apparently missed the 8,500-ft. Frio sand that produces in the Chenango field, and is expected to test sands in the basal Frio which produce in the Anchor field at 9,800 ft. and 10,400 ft. In the Bailey's Prairie area, Glenn McCarthy 1 Munsion, H.T.&B. Survey 1, is drilling in shale below 11,192 ft. with no shows of oil or gas reported. A protection string of 7-in. casing was cemented the previous week at 10,896 ft.

Second Test Planned in Millican Salt Dome

On the Millican salt dome, Brazos County, Phillips Petroleum Co. is reported to be preparing to start drilling operations on another well with the abandonment of 1 Schoeps, abandoned in anhydrite at 5,190 ft. The well is located about 1½ miles southeast of 1 Mitchell, which established the structure a salt dome by topping salt material at 5,511 ft.

Superior 1 W. O. Smythe, a wildcat located in the William D. Smith Survey, Liberty County, is drilling in shale below 9,835 ft. Sand with an oil odor and slight cut was logged at 9,062-71 ft., and gas sand at 9,074-80 ft.

Ramers Island Test Flows

In the Ramers Island area, Tyler County, American Republics et al 1 Cushing was tested through perforated casing at 5,395-96 ft., and the well flowed 40 bbl. of oil in 11 hours through a ⅛-in. choke, at which time it started making gas, and the well has been killed preparatory to squeezing off and reperforating.

Of the 16 new locations reported in the district, two were wildcats in Jackson and Grimes County, and the balance were located in proven fields of Jackson and Wharton counties. For the first time in several months there were no completions reported for the West Ranch field, and many of the other active fields in the county such as Lolita, Maurbro and North La Ward, failed to report more than one completion during the week.

TEXAS GULF COAST COMPLETIONS

Wildcats

Brazoria County: Prospect Drilling Co. 1 C. W. Mowery, top Heterostegina 6,086 ft., round Marginulina 6,252 ft., flat Marginulina 6,783 ft., Frio 6,485 ft., dry, T.D. 6,542 ft.

Jackson County: J. G. Mayo 1 Reserve Realty Co., dry, T.D. 7,520 ft.

Fields

Anahuac, Chambers County: Humble 64 Middleton, top Discorbis 6,301 ft., Heterostegina 6,674 ft., Marginulina 6,862 ft., Frio 7,275 ft., dry, T.D. 7,300 ft.

North La Ward, Jackson County: Magnolia 1 Gordon, 116 bbl., ¼-in. choke, perf. casing 5,217-21 ft., T.D. 5,225 ft.

Maurbro, Jackson County: Humble 3 G. W. Edwards, dry, T.D. 5,430 ft.

WILDCAT LOCATIONS

Grimes County: H. C. Cockburn 1 W. Goyle, 2 mi. NW of the town of Todd, C. B. Stewart Sur.

Jackson County: Gulfboard 1 J. E. Harmon, Morris & Cummings Sur. 23, 1 mi. SE of the Ganado field, Sun Oil Co. farmout.

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LOUISIANA GULF COAST

Three Flank Extensions Found On Pine Prairie Dome

By F. L. SINGLETON

NEW ORLEANS, La.—Development around the flanks of the Pine Prairie dome, Evangeline Parish, was expected to be increased with the completion of three producers, all of which extended production. Perhaps the most important completion was E. J. Nicklos 2 Reed located on the southeast flank which flowed 780 bbl. daily through a ¼-in. choke from perforated casing opposite sand at 7,780-92 ft. Tubing pressure was 1,500 lb., and casing pressure 1,525 lb. This is one of the largest producers completed in the area, and production is from a sand section several hundred feet above the discovery sand at 8,200-8,300 ft. On the northeast flank, Humble 1 Guillory flowed at the rate of 400 bbl. daily from the 8,300-ft. pay while a slight extension was recorded on the northeast flank by Stanolind 1 Ardoin, which is flowing ungaged from the same sand.

Cities Service 1 Lacassine, the discovery well of the Thornwell prospect, Jefferson Davis Parish, gaged 15 bbl. of 51.8 water-white distillate and 1,125,000 cu. ft. of gas daily while testing through a 9/64-in. choke. Tubing pressure was 3,450 lb., and casing pressure 900 lb. Total depth of the well is 10,325 ft., and production is from perforated casing at 9,532-38 ft. Other gas-distillate sands were logged at approximately 9,800 ft. and 10,300 ft.

Northwest Vinton Outpost Dry

On the northwest flank of the Vinton field, Calcasieu Parish, Union Oil Co. of California 1-G Gray is shut down at a total depth of 4,380 ft., and the well may be abandoned or be plugged back and sidetracked in an attempt to locate the shallow sand recently proven productive further to the south. The discovery of the shallow sand resulted in a revival of drilling around this old structure, but the results thus far have been disappointing, although no letup in development is anticipated in the near future.

Superior 1 C. K. Schwing, an interesting south outpost test on the Bayou Blue dome, Iberville Parish, were abandoned in salt at 5,148 ft. Top of the salt was logged at 5,152 ft. Further development in this area is expected.

On the northeast flank of the Sorrento dome, Ascension Parish, Pan American Production Co. was preparing to test 20 United Lands which is expected to add new production to this old structure. Total depth of the well is 4,522 ft., and 5½-in. casing was cemented at 4,192 ft., preparatory to testing sands logged at 4,508-90 ft., and at 4,132-45 ft.

Deep Wilcox Test at Neale Recompleted

Recompletion of Atlantic 1 Hawkins in the Neale field, Beauregard Parish, resulted in an initial production of 325 bbl. of 47.9-gravity oil daily through a ⅞-in. choke from perforated casing at 10,990-11,110 ft. This is the deepest Wilcox production thus far developed on the structure, and the deepest to be found along the entire Wilcox trend. The company's 1 Lilledol, a southwest outpost test is preparing to test this same sand after salt water and some oil were recovered in a test of a lower sand.

Humble Oil & Refining Co. added another producer to the Bayou Sale structure, St. Mary Parish, with the completion of 4-B Wooster on the east side of the structure which is flowing at the rate of 400 bbl. daily through various chokes, while testing the main sand at 10,100 ft. In the meantime, preparations are being made to spud 1 H. H. Gates, a north outpost in 13-16s-9e. Thus far only two dry holes have been drilled on the structure, these being located on the west and northeast sides, although production from the 10,100-ft. sand was more or less defined on the east side by the recompletion of Humble 3-B Wooster, completed in a shallow sand at 4,500 ft. after failing to flow from the 10,100-ft. sand.

The Lake Chicot field, St. Martin Parish, had promise of a new sand discovery as Amerada Petroleum Corp. and Phillips Petroleum Co. prepared to test 1 Schwing & Case which is bottomed at a total depth of 11,620 ft. The well is reported to have missed the discovery pay at 9,000 ft. Details as to what sands have been logged were not available.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Assumption Parish: George Echols 2 Armelis Planting Co., dry, T.D. 9,131 ft.

Fields

Barataria, Jefferson Parish: Reese E. Carter 99 Pallet Realty Co., 89 bbl., 5/32-in. choke, perf. casing 10,053-55 ft., T.D. 10,090 ft.

(Continued on Page 116)

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APPALACHIAN FIELDS

Gordon and Big Injun Provide Best Wells in Quiet Week

PITTSBURGH, Pa. — Except for a fair Gordon sand gas well and a fair Injun sand gas well in West Virginia the week was uneventful.

SOUTHWEST PENNSYLVANIA

On the Washington anticline in Richhill Township, Greene County, Natural Gas Co. of West Virginia is drilling at 6,837 ft. in the deep test on the Andrew Workman farm. This is 50 ft. below the point in the Onondaga at which casing was set. The Onondaga was topped at 6,757 ft. and is expected to be about 200 ft. thick. It is possible the Oriskany sand may be struck in another week.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co set whipstock at 7,475 ft. to bypass lost tools in the Onondaga chert in the test on the Jacobs Creek oil lease, and is now drilling by at 7,510 ft.

In Slippery Rock Township, Lawrence County, John T. Galey et al have spudded in the test scheduled for the Oriskany sand on the Miller and Myers lease about 1 mile due north of the town of Energy.

On Chestnut Ridge in South Union Township, Fayette County, New Penn Development Co., William E. Snee et al are drilling at 6,941 ft. at 1 Kirby and appear to be reaching Tully lime. These operators are building the rig to deepen 1 Heyn, the discovery well. Peoples Natural Gas Co. has reached 8,110 ft. in 4 Piedmont Coal Co. with the formation showing some lime. So far no Lower Devonian markers have been identified. The hole has been running so low on structure that it is probably on the downthrow side of the Turkey Nest fault which is exposed on the surface in the road cut above Hopwood. The throw of this fault, however, was not expected to be as great as is now suggested. This test may end at about the closing contour of the closure.

In Maryland, William E. Snee et al have completed the rig for the second test on the Accident dome located on the George Georg farm about 1,500 ft. northwest of the Humberson (Schartzer) test in Garrett County.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Kiskiminitas Township: Chestnut Ridge Gas Co. 1 E. T. Culp, 169,000 cu. ft. gas, Speechley sand 2,910-30 ft., gas 2,915-19 ft., Tiona 3,095-3,125 ft., gas 3,097 ft., Bradford 3,510-30 ft., gas 3,512 ft. and 3,520 ft., T.D. 3,553 ft.

Clarion County, Monroe Township: Frank Shreffler et al 2 Tate Henry, 82,000 cu. ft. gas, Murraysville sand 935-1,045 ft., gas 965 ft., Hundred Foot sand 1,106-66 ft., gas 1,152-56 ft., Speechley sand 2,338-70 ft., gas 2,343-45 ft., Sheffield sand 2,670 ft., gas 2,700 ft., T.D. 2,702 ft.

T. W. Phillips Gas & Oil Co. 4 F. E. McElhattan, 35,000 cu. ft. gas, Speechley sand, T.D. 2,630 ft.

Porter Township: Gourley Gas Co. 3 Abdrew Gourley, 59,000 cu. ft. gas, Speechley sand, T.D. 2,520 ft.

Fayette County, German Township: Peoples Natural Gas Co. 1 Frank Martin, 30,000 cu. ft. gas, Fifty-foot sand 2,330-2,445 ft., gas 2,405 ft., T.D. 3,008 ft.

Greene County, Franklin Township: Manufacturers Light & Heat Co. 1 Roy R. Rice, 122,000 cu. ft. gas, Fifth sand 3,298 ft., gas 3,303-05 ft., T.D. 3,477 ft.

Washington County, West Bethlehem Township: Bentleyville Fuel Co. 1 George Wherry, 231,000 cu. ft. gas, Salt sand 1,355 ft., gas 1,380 ft., T.D. 1,380 ft

Westmoreland County, Allegheny Township: Peoples Natural Gas Co. 1 Sarah Beale, 21,000 cu. ft. gas, Speechley sand, T.D. 3,156 ft.

WEST VIRGINIA

In Gilmer County, West Virginia, there was a good strike in the test of the Mud Lick Oil & Gas Co. on the D. R. Means farm in Troy district. The Big Injun sand was topped at 1,744 ft. and at 1,746 ft. there was a gas volume of 5,512,000 cu. ft. before shot.

In Meade district, Tyler County, the deep test of Benedum & Trees on the Pearl Broadwater farm is drilling at 1,520 ft. after having been held up with a long fishing job.

WEST VIRGINIA COMPLETIONS

Calhoun County, Center district: Hope Natural Gas Co. 8594 Bennett heirs, 622,000 cu. ft. gas, Big lime 1,711-1,800 ft., Big Injun 1,800-70 ft., gas 1,847-68 ft., shot 1,846-67 ft., T.D. 1,914 ft.

Marion County, Mannington district: South Penn Natural Gas Co. 14 Jacob Cunningham, 3 bbl. before shot, Bayard sand, T.D. 3,501 ft., will be shot.

Mason County, Waggoner district: Interstate Utilities Co. 1 Oris Dodson, 15,000 cu. ft. gas after shot, elev. 717.82 ft., Berea 1,677-1,755 ft., T.D. 1,755 ft., will abandon.

Pleasants County, Jefferson district: Leavitt & Black 1 C. T. Leavitt, 5,000 cu. ft. gas, through Berea to 3,220 ft., filled back to stray sand at 330 ft. to produce gas.

Putnam County, Curry district: Dennis M. Roy 1 Oscar Johnson, 103,000 cu. ft. gas after shot, Salt sand 985-1,035 ft., Big lime 1,476-1,641 ft., Injun 1,676-1,710 ft., Berea 2,198-2,224 ft., T.D. 2,242 ft.

Wetzel County, Proctor district: Carnegie Natural Gas Co. 1 Herman L. Goddard, 2,943,000 cu. ft. gas, Gordon sand 3,040 ft., gas 3,050 ft., T.D. 3,050 ft. Samuel J. Brendel et al 1 Thurman Goddard, 500,000 cu. ft. gas, Gordon sand, T.D. 3,090 ft.

(Continued on Page 116)

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GAUGES

Bible Grove Discovery Flows When Deepened to McClosky

MATTOON, Ill. — Excitement swept through Clay County last week when a test hailed as a Cypress pool opener drilled deeper into 7 ft. of excellent McClosky lime saturation. A. A. Cameron 1 Landwehr, NW NW NE 8-5n-7e, which 2 weeks ago recovered oil and gas-cut mud during a drill-stem test of the Cypress sand, flowed 28 bbl. of oil in 18 minutes on a drill-stem test of the McClosky lime, topped at 2,805 ft. The well is bottomed at 2,821 ft. and probably will be completed next week.

The oil industry generally appeared more interested in this well than any yet drilled in 1942, although it has not yet been given a production test, and Clay County oil operators are already calling the area another Johnsonville pool. The Johnsonville pool, discovered in Wayne County last summer, was the most prolific McClosky lime pool yet found in Illinois. Nearest production to 1 Landwehr is 10 miles south in the Sailor Springs pool. No dry holes have been drilled within 3 miles of the test.

Four Tests Near Pay

Three wildcats were testing the McClosky in Wayne County last week and another was exploring that formation. Those in the testing stage include the Wright, Hamm & Hays 1 Townes, in 18-1n-7e, northwest of the Clsne and northeast of the Johnsonville pool; Gulf 1 Obe Henson, W½ SW NW 19-1n-5e, and the Bell Bros. 1 Jones, W½ SE NE 24-1n-5e. All three wells are fighting water trouble. None of these testing wells looks particularly good but all of them offer hopes for large new areas. The fourth well was the Schuler & Lynch 1 Spencer, 3 miles east of Fairfield, W½ NW SE 2-2s-8e, which is drilling in the McClosky.

Rural Hill Test Granted Exception

One of the most interesting developments in the basin last week was a Rural Hill operation in Hamilton County where drilling was begun again on a 1-acre location which was started after December 23 and later ordered shut down by the Office of Petroleum Coordinator. Permission to complete the well was evidently obtained directly from Washington.

The well was spudded after December 23 when federal regulations became effective but was reportedly down 1,900 ft. before news of the regulations reached the operators.

ILLINOIS COMPLETIONS

Wildcats

Clay County: Rumley & Heiss 1 Chaney Bros., E½ SE SE 18-3n-7e, dry at 3,061 ft., Menard 2,216 ft., Glen Dean 2,442 ft., Golconda 2,524 ft., Cypress 2,625 ft., Benoist 2,805 ft., Renault 2,826 ft., Aux Vases 2,891 ft., Ste. Genevieve 2,930 ft., Rosiclare 2,945 ft., Fredonia 2,992 ft., McClosky 3,044 ft.

Jasper County: Paul Johnson 1 Black & Ward, W½ NE NE 14-5n-9e, dry at 3,051 ft., Kincaid 2,172 ft., Glen Dean 2,495 ft., Golconda 2,574 ft., Barlow 2,629 ft., Cypress 2,727 ft., Renault 2,916 ft., Ste. Genevieve 2,990 ft., Rosiclare 3,005 ft.

Macon County: Margrew & Pollock 1 Riley, SW SE N 21-15n-2e, dry at 1,333 ft., Benoist 1,321 ft.

McDonough County: C. B. Talbot 1 Powell, SE SE NI 29-4n-4w, dry at 1,975 ft.

Richland County: Bonpas Dev. 2 J. M. Woods, W½ SW SE 21-2n-14w, flowed 1,068 bbl., 5,000 gal. acid, Ste. Genevieve 3,040 ft., pay 3,090-97 ft., T.D. 3,097 ft., *pool opener.*

Williamson County: Superior 1 E. H. Jones, NW SW SE 14-10s-3e, dry at 2,531 ft., Kincaid 934 ft., Clore 1,155 ft., Palestine 1,249 ft., Menard 1,346 ft., Watersburg 1,447 ft., Vienna 1,517 ft., Glen Dean 1,618 ft., Golconda 1,750 ft., Barlow 1,903 ft., Cypress sand 1,925 ft., Paint Creek 2,052 ft., Benoist 2,103 ft., Renault 2,128 ft., Aux Vases 2,216 ft., Ste. Genevieve 2,263 ft., Rosiclare 2,318 ft., Fredonia 2,327 ft.

Fields

Dale, Hamilton County: Cameron Bros. 8 Kern, SW SW SW 7-6s-7e, pumped 175 bbl., 100-qt. shot 3,038 69 ft., Aux Vases 3,031 ft., T.D. 3,069 ft.

Dundas, Jasper County: Pure 3 Richards, E½ SW 7-5n-10e, flowed 600 bbl., 5,000 gal. acid, McClosky pay 2,825-28 ft., 2,833-41 ft., 2,851-58 ft., T.D. 2,868 ft.

East Centerville, White County: McBride 2 Daly, trustee, SE SW SW 7-4s-10e, flowed 525 bbl., natural, McClosky 3,224-29 ft., T.D. 3,229 ft.

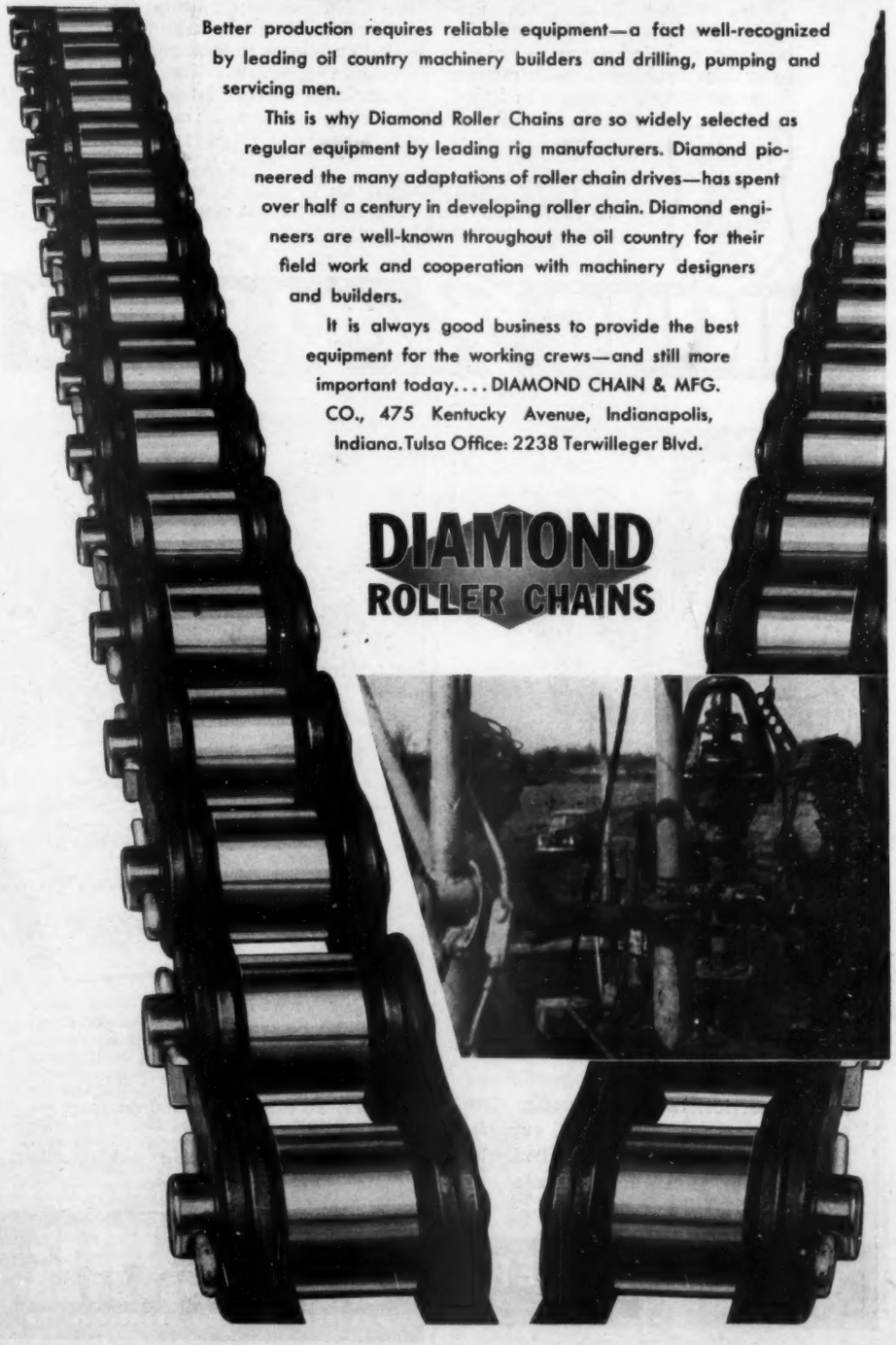
Sun 1 C. M. Baird, S½ NW SW 7-4s-10e, dry at 3,312 ft., base Pennsylvanian 2,035 ft., Kincaid 2,148 ft., Menard 2,428 ft., Vienna 2,538 ft., Tar Springs 2,564 ft., Golconda 2,785 ft., Barlow 2,913 ft., Cypress 2,930 ft., Paint Creek 3,010 ft., Renault 3,110 ft., Aux Vases 3,127 ft., Ste. Genevieve 3,204 ft., McClosky 3,289 ft.

Inman, Gallatin County: Magnolia 1 J. D. McGuire, NE NE SW 19-8s-10e, pumped 148 bbl. oil and 1 bbl. water, natural, Waltersburg sand 1,990 ft., T.D. 2,001 ft.

Iron, White County: Hinton Drlg. 1 Bryant, W½ S NE 26-6s-8e, dry at 3,116 ft., Menard 2,160 ft., Waltersburg 2,236 ft., Vienna 2,281 ft., Tar Springs 2,290 ft., Glen Dean 2,422 ft., Hardinsburg 2,468 ft., Cypress 2,728 ft., Paint Creek 2,786 ft., McClosky 3,026 ft.

New Harmony, White County: Washburn & Powers 1 Brown, NW SE NW 20-4s-14w, dry at 2,985 ft., Menard 2,249 ft., Tar Springs sand 2,381 ft., Glen Dean 2,436 ft., Golconda 2,554 ft., Barlow 2,671 ft.,

BACK UP THE MEN IN THE FIELD



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DRESSER
MANUFACTURING CO., BRADFORD, PA.

Cypress sand 2,714 ft., Benoist 2,815 ft., Renault 2,885 ft., Aux Vases sand 2,959 ft., junked hole.

Superior 4-A E. M. Fitten, N½ S½ SW SE 28-4s-14w, pumped 60 bbl., 60-qt. shot 2,824-42 ft., old well deepened from 2,827-42 ft.

North Benton, Franklin County: A. W. Torbett 1 Isaacs, SW SE NW 1-6s-2e, dry at 2,874 ft., Barlow 2,474 ft., Cypress sand 2,492 ft., Ste. Genevieve 2,732 ft., Rosiclare 2,788 ft., Fredonia 2,843 ft.

North Noble, Richland County: Pure 1 Chapman, W½ NW NW 13-4n-9e, 3,800,000 cu. ft. gas, 1,200 lb. S.I. pressure, Fredonia 2,924 ft., gas 2,926-38 ft., T.D. 2,955 ft.

Rural Hill, Hamilton County: Texas 4 E. Smith, SE SE SE 12-6s-5e, flowed 341 bbl., 35-qt. shot 3,071-88 ft., Aux Vases 3,064-90 ft., T.D. 3,330 ft., P.B. 3,105 ft.

Shell 4-B L. F. Lockwood, SW NE SW 13-6s-5e, flowed 312 bbl. oil and 8 bbl. water, Aux Vases, Levias, and McClosky, perf. 3,222-42 ft., 3,316-20 ft., 3,354-80 ft., 3,000 gal. acid in lower McClosky, 1,000 gal. acid, reacidized 3,000 gal., 25-qt. shot 3,155-72 ft., Aux Vases sand 3,140 ft., Levias 3,224-40 ft., McClosky 3,313-18 ft., 3,356-66 ft., T.D. 3,399 ft.

Shell 5 C. A. Smith, SW NE SE 13-6s-5e, flowed 3 bbl. oil and 5 bbl. water, perf. 3,218-36 ft., 3,3[illegible]28 ft., 3,346-54 ft., 3,000 gal. acid, reacidized 2,000 gal., Aux Vases 3,144-78 ft., Levias 3,222-30 ft., McClosky 3,310-25 ft., T.D. 3,397 ft.

Shell 1-B J. F. Crabtree, W½ NE NE 23-6s-5e, pumped 147 bbl., 20-qt. shot 3,087-3,101 ft., perf. 3,152-78 ft., 3,288-98 ft., 1,000 gal. acid, reacidized 3,000 gal., Aux Vases 3,078-3,112 ft., Ste. Genevieve 3,112 ft., saturation 3,157-72 ft., T.D. 3,328 ft., P.B. 3,118 ft.

Shell 2-C Lockwood, SW NE NW 24-6s-5e, flowed 235 bbl. oil and 11 bbl. water, Aux Vases, Levias, and McClosky, perf. 3,164-70 ft., 3,180-90 ft., 3,249-64 ft., 3,320-30 ft., 3,334-42 ft., 1,500 gal. acid in upper McClosky, 1,000 gal. acid in Levias, 20-qt. shot 3,106-20 ft., Aux Vases 3,091 ft., Levias 3,160-70 ft., McClosky 3,322-30 ft., 3,336-42 ft., T.D. 3,353 ft.

Texas 1 J. C. Hall, SW NW NW 18-6s-6e, flowed 14 bbl., Aux Vases, Levias, and McClosky perf. 3,194-3,208 ft., 3,287-98 ft., 3,305-09 ft., 3,000 gal. acid, 40-qt. shot 3,119-47 ft., Aux Vases sand 3,108-16 ft., Levias 3,192-3,214 ft., McClosky 3,285-91 ft., 3,306-13 ft., T.D. 3,318 ft.

Salem, Marion County: Magnolia 31 W. B. Young, NW SW NE 20-2n-2e, flowed 72 bbl., 230-qt. shot 4,536-4,625 ft., Trenton 4,507 ft., old well deepened from 3,450-4,635 ft.

Simms, Wayne County: Armstrong-Day and Texas 1 Elliott-Warren Comm., W½ SW NW 27-1s-6e, flowed 1,085 bbl., natural, perf. 3,168-82 ft., McClosky 3,168-82 ft., T.D. 3,192 ft.

Stringtown, Richland County: Helmerich & Payne 1 Sterchi heirs, S½ SW SW 31-5n-14w, pumped 188 bbl. oil and 12 bbl. water, 3,000 gal. acid, Ste. Genevieve 3,000 ft., T.D. 3,062 ft.

West Clay City, Clay County: Pure 1 Bayler, N½ SW SE 10-2n-7e, flowed 258 bbl., 5,000 gal. acid, Ste. Genevieve 3,018 ft., pay 3,060-67 ft., T.D. 3,080 ft.

Woodlawn, Jefferson County: E. M. Self 4 Zinke, N½ SW SW NW 35-2s-1e, pumped 110 bbl., 20-qt. shot 1,996-2,006 ft., Benoist 1,990 ft., T.D. 2,006 ft.

Louisiana Gulf Coast Fields

(Continued from Page 113)

Chaikley, Cameron Parish: Shell 13 Hanzen, 41 bbl., gas lift, T.D. 8,905 ft.

Gibson, Terrebonne Parish: Shell 8 Realty Operators, 406 bbl., 10/64-in. choke, sand 9,202-10 ft.

Gueydan, Vermilion Parish: Fohs 2 Grady Lee Humble, dry, T.D. 7,536 ft.

Pure 11 Alliance Trust, 305 bbl., 10/64-in. choke, perf. casing 9,850-92 ft., T.D. 9,955 ft.

Lafitte, Jefferson Parish: Texas 20 Lafitte, 328 bbl., 5/32-in choke, perf. casing 9,446-90 ft., T.D. 10,165 ft.

Lake Long, La Fourche Parish: Fohs 16 Lake Long, dry, T.D. 10,262 ft.

Paradis, St. Charles Parish: Texas 18 L. L. & E. Paradis, 379 bbl., ¼-in. choke, perf. casing 10,320-50 ft., T.D. 10,490 ft.

St. Gabriel, Iberville Parish: Shell 4 Natalbany Lbr. Co., 189 bbl., 8/64-in. choke, perf. casing 8,590-8,602 ft., 8,613-24 ft., T.D. 8,651 ft.

Ville Platte, Evangeline Parish: Continental 2 Deville, 162 bbl., 12/64-in. choke, perf. casing 10,045-72 ft., T.D. 10,263 ft.

Gulf 4 Vidrine, 195 bbl., ¼-in. choke, perf. casing 10,092-10,102 ft., T.D. 10,320 ft.

Welsh, Jefferson Davis Parish: Union Sulphur 3 Unit, dry, T.D. 8,790 ft.

West Lake Verret, St. Martin Parish: Shell 2-B Norman-Breaux, 307 bbl., 8/64-in. choke, perf. casing 11,484-96 ft., T.D. 11,498 ft.

Appalachian Fields

(Continued from Page 114)

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Joe Rubin et al 1 U. G. Weekley, 49,000 cu. ft. gas, elev. 667 ft., Big lime 1,742 ft., Berea 2,383 ft., Corniferous lime 4,865 ft., Oriskany 4,980 ft., shot 4,978-5,013 ft., no R.P., T.D. 5,055 ft.

Ripley district: Godfrey L. Cabot, Inc., 29 Putnam Co., 11,052,000 cu. ft. gas, elev. 864 ft., Big lime 1,926 ft., Berea 2,465 ft., Corniferous lime 5,039 ft., Oriskany 5,139 ft., shot 5,147-73 ft., R.P. 1,590 lb., T.D. 5,207 ft.

Lost Springs and Kraft-Prusa Fields Are Extended

By CARL HOOT

THE decline in field activity in Kansas continues but wildcatting has not been so seriously reduced and has scored a number of successes during the week. Two pools were extended by small wells, Lost Springs in Marion County, and Kraft-Prusa in Barton County.

The Marion pool extension was Veeder Oil & Gas 1 Williams, N½ NW SW 35-17-4, ½ mile south of production. It made 45 bbl. from the chat at 2,384 ft. The Kraft-Prusa field was extended 1½ miles west by Black-Marshall 2 Schneweis, SW NE NW 5-17-11w, which made 65 bbl. from the Arbuckle lime at 3,358 ft. This well is one of a number which is gradually merging the Kraft-Prusa pools into a single major field, comparable in size to Hall-Gurney and other Central Kansas fields which have been developed for several years but have seen renewed activity as outpost after outpost has been successfully completed.

Stafford County Wildcat Has Show of Oil in Arbuckle

Adair & Morton 1 Roberts, CN½ NE NE 14-21-12w, cemented 5½-in. casing at 3,554 ft. and after drilling cement to 3,558 ft., loaded the hole with 3,500 ft. of water. Thirty feet of 4-in. liner was perforated to 3,558 ft. in the Arbuckle, with a show of oil at that depth. Other oil shows were found at 3,332-55 ft. and 3,356-59 ft.

Nadel & Gussman 1 Stone, NW NW SW 16-25-11w, of Stafford County, was drilling ahead at 3,840 ft. A slight showing of oil was found at 3,521-24 ft.

Falcon-Seaboard et al 1 Lemon, a wildcat in the NE NE NW 32-27-14w, of Pratt County, had a showing of oil at 4,200 ft., topped the Mississippi lime at 4,440 ft., with a show of gas at 4,445-60 ft.

In northwestern Barber County Luther Mackall 1 Hoss, CN½ NW NW 12-30-15w, was drilling ahead at 4,512 ft. Porous zones were found at 3,980-85 ft., 4,028-32 ft., 4,090-93 ft., 4,107-11 ft., and 4,155-60 ft. Oil shows were topped at 4,090 ft. and 4,107 ft.

Earl Wakefield 1 Henderson, CN½ NW NW 26-32-3, a wildcat about 4 miles west of Winfield in Cowley County, had a hole full of water at total depth of 3,462 ft. and was waiting on cement after setting 5-in. casing at 2,730 ft. The well made an estimated 10 bbl. of oil per day from the Kansas City lime at 2,680 ft. Other tops were the Mississippi lime at 3,146 ft. and Arbuckle lime 3,453 ft.

Water Exhausted in Barber County Gas Discovery

Champlin Refining Co. 1 Hildebrand, a wildcat in CE½ NE NW 26-32-15w, Barber County, made an estimated 3,000,000 cu. ft. of gas after cementing off perforations from 4,925-30 ft. and 4,935-40 ft. to shut off water. Three holes were then made from 4,941-45 ft. and four holes at 4,963-66 ft. with no increase in gas. Water was exhausted after a small spray.

KANSAS COMPLETIONS

Wildcats

Butler County: Ash & Plymate 1 Hannabaum, NE SW SE 15-24-4, dry, T.D. 2,603 ft., Lansing 1,835 ft., Mississippi lime 2,488 ft., 7-in. casing 2,489 ft., water 2,491 ft., increase of water and show of oil 2,526 ft.

Graham County: Cities Service 1 Newell, SW SW SE 21-8-21w, dry, T.D. 3,700 ft., Topeka 3,063 ft., Lansing 3,334 ft., base Kansas City 3,545 ft., Arbuckle 3,655 ft., saturation 3,663-67 ft., perforated 3,663-67 ft.

Reno County: Luther Mackall 1 Frederick, SW SW NE 4-26-5w, dry, T.D. 4,100 ft., Lansing 2,803 ft., Mississippi lime 3,549 ft., show oil 3,549-53 ft., base Mississippi 3,758 ft., Misener 3,924 ft., Viola 3,926 ft., Simpson shale 3,986 ft., Simpson sand 3,990 ft., light stain 3,990-4,002 ft., Arbuckle 4,074-4,100 ft.

Rice County: Nelson Drilling 1 Smyres, NE NE SW 36-19-6w, flowed 3,000 bbl. 36.6 gravity from Mississippi lime 3,339-54 ft., Lansing 2,778 ft.

Fields

Ainsworth, Barton County: Texas 1 Cook, C W½ NW SW 21-16-13w, dry, T.D. 3,453 ft.

Bedford, Stafford County: Stanolind 1-B Allen, NW NW SW 27-23-12w, 50 bbl., Arbuckle, T.D. 3,839 ft.

Bemis, Ellis County: Deep Rock 37 Baumer, C E½ SW 27-11-17w, 3,000 bbl., Arbuckle, T.D. 3,585 ft.

Big Creek, Russell County: El Dorado Refining 1 St. Aubyn, NW NW NE 1-15-15w, dry, T.D. 3,224 ft.

Burnett, Ellis County: Virginia Drilling 1 Feldkampf, S½ NE NW 11-11-18w, pumped 2,955 bbl., Arbuckle 3,475-77 ft.

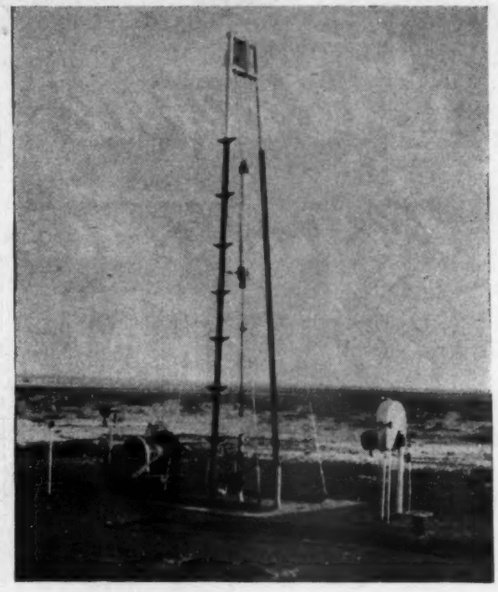
Couch, Cowley County: Helmerich & Payne 1 Marlow, NW NE NE 24-30-5, dry, T.D. 2,832 ft.

Cunningham, Pratt County: S. A. Springer 3 Sitton, S½ SE NW 35-27-11w, pumped 849 bbl., Lansing 3,473-3,507 ft.

Davidson, Barton County: H. H. Blair 1-B Peirano, N½ NW NW 3-16-11w, pumped 618 bbl., Lansing 2,970-3,062 ft.

Eberhardt, Barton County: C. E. Ash 1-A Roth, N½

(Continued on Page 118)



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The following patents have been issued on the Nixon Surface Control Gas-Lift System: 1,735,025; 2,132,081; 2,136,457; 2,153,770; 2,164,469; 2,171,812; 2,171,478; 2,171,479; 2,171,480; Re 21,199; 2,202,462; 2,204,817; 2,217,002; 2,245,002; 2,245,003; 2,245,004; 2,245,005; 2,245,006; 2,245,007; 2,245,008; 2,245,009; 2,245,010. Other patents pending.

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EASTERN TEXAS FIELDS

Glen Rose Test Announced For Henderson County

By ROBERT INGRAM

DALLAS, Tex.—A 9,000-ft. wildcat in northeastern Henderson County was announced last week by the Texas Co. It was 1 E. T. Brown, 3,300 ft. from the west line and 1,980 ft. from the south line of the Armstad Eans Survey, about 2 miles northeast of the community of New York and 10 miles south of the Opelika Rodessa section Glen Rose lime gas-distillate area.

The well was contracted to the Woodbine sand section, but the company announced that if the Woodbine was dry, the well would be carried on down to the Rodessa section of the Glen Rose which is expected at between 8,000 ft. and 9,000 ft.

Location was made on the basis of geophysical information on a block of 14,000 acres assembled by I. P. La Rue of Dallas.

Chapel Hill Flank Completion Extends Pettit Pay

Pettit lime oil production was extended ½ mile east on the northeast flank of the Chapel Hill pool of eastern Smith County at Sun Oil Co. 1 Warren, John Slaydon Survey. The well was completed for 257.89 bbl. of 42.2-gravity oil in 24 hours through $\frac{4}{16}$-in. choke. Shut-in pressure on casing was 1,590 lb. and 1,490 lb. at the beginning and end of the test. Flowing pressure on tubing was 1,250 lb. at the beginning and 575 lb. at the end of the test.

Meantime, Delta Drilling Co. of Tyler had spudded and was drilling below 938 ft. in shale and boulders in 1 Jim Walton, Stillwell Box Survey, in the northern end of the pool.

Flag Lake Outpost Staked

A semiwildcat, Bert Fields and Topaz Oil Co. 1 Alice May, 330 ft. from the northeast and south lines of the J. P. Tarkington Survey, was staked last week to test the area southwest of the Terrapin Ridge portion of the Flag Lake pool and north and west of production in the Bazette pool across the Trinity River.

EAST TEXAS COMPLETIONS

Wildcats

Cherokee County: Sinclair 1 T. F. C. Mullinix, Evan Bolton Sur., dry at 5,139 ft.

Hopkins County: Donnie Petroleum Co. 1 S. A. Welborn, J. Webb Sur., dry at 4,500 ft., top Woodbine 4,464 ft.

(Continued on Page 119)

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GRIZZLY ROTARY BLOCKS

Kansas Fields

(Continued from Page 117)

NE NE 25-19-11w, pumped 343 bbl., Arbuckle 3,316-32 ft., T.D. 3,334 ft.

Frog Hollow, Cowley County: Leader Oil and Zephyr Drilling 2 Elliott, SW NE SE 17-32-5, flowed 638 bbl., Bartlesville 3,015-31 ft.

Greenvale, Russell County: Stanolind 2 Zeman, N½ NE NE 9-15-12w, dry, T.D. 3,462 ft.

Hall-Gurney, Russell County: R. H. Shields 10 Letsch, SW SW SE 27-14-13w, pumped 1,460 bbl., Lansing 2,862-75 ft.

Henne, McPherson County: Texas 1 Mary Tolle, CSL SW SE 16-17-1w, 701 bbl., chat, T.D. 2,662 ft.

Keesling, Rice County: Brown & Willard 3 Proffitt, E½ NE NW 9-20-9w, pumped 549 bbl., Arbuckle 3,224-36 ft.

Kraft-Prusa, Barton County: Texon 1 Esfeld, E½ SE SW 20-16-11w, pumped 3,000 bbl., Arbuckle 3,298-3,309 ft.

Black-Marshall 2 Schnewels, SW NE NW 5-17-11w, 65 bbl., Arbuckle, T.D. 3,358 ft.

Shell Oil 1-B Seeken, C NE NE 21-17-11w, 3,000 bbl., Arbuckle, T.D. 3,277 ft.

East Kraft, Barton County: J. J. Lynn 1 Smith, C NE SW 36-16-11w, 41 bbl., Arbuckle. T.D. 3,373 ft.

Lost Springs, Marion County: Ring-Mac 1 Henke, CWL NW NE 4-18-4, 225 bbl., chat, T.D. 2,409 ft.

Veeder 1 Williams, CNL NW SW 35-17-4. 45 bbl., chat, T.D. 2,384 ft.

McLouth, Jefferson County: O. J. Connell 1 Garrett, C NW NE 30-9-20, dry, T.D. 1,530 ft.

O. J. Connell 2 Edmonds, C NW NE 21-9-20, gaged 5,000,000 cu. ft. gas in Bartlesville sand 1,424 ft., T.D. 1,430 ft.

Peace Creek, Reno County: Magnolia 4 Yust, SW SE SW 15-23-10w, flowed 35 bbl. in 1 hour, Viola 3,768-75 ft.

Cities Service 1 Estey, NE NW NW 14-23-10w, flow by heads, 45 bbl. 3½ hours, Viola 3,758-70 ft.

Leader Oil 3 Tonn, C SW SE SW 11-23-10w, 3,000 bbl., Viola, T.D. 3,764 ft.

Raymond, Rice County: Hyde-Stormfeltz 1 Rick, C S½ SW SE 17-20-10w, 3,000 bbl., Kansas City, T.D. 3,127 ft.

Roxbury, McPherson County: H & M Drilling 2 Anderson, E½ NE NW 21-17-1w, pumped 54 bbl., Lansing 2,650-65 ft., T.D. 3,684 ft.

Shaeffer, Stafford County: R. L. Windmuller 1 Fanshier, N½ NE NE 9-21-13w, dry, T.D. 3,574 ft.

Silica, Rice County: Sharon Drilling 1-A Schubert, N½ NW SE 9-20-10w, dry, T.D. 3,424 ft.

Silica, Barton County: Herndon Drilling 2 Hagen, SE NW SW 20-20-11w, pumped 338 bbl., Arbuckle 3,314-35 ft.

Iron 1 Bacon, CSL SW SW 8-20-11w, 1,514 bbl., Arbuckle, T.D. 3,315 ft.

Walter, Ellis County: Stanolind 1 Baker, E½ NE SE 10-12-18w, dry, T.D. 3,865 ft.

Westhusin, Rooks County: Earl Wakefield 1 Westhusin estate, NE NE NW 14-9-17w, dry, T.D. 3,535 ft.

J. Leavell 1 Baxa, SW SW NW 12-9-17w, 575 bbl., Kansas City, T.D. 3,318 ft.

Zenith, Stafford County: Stanolind 7-A Ferris, C E½ SW SE 15-24-11w, 231 bbl., Misener, T.D. 3,830 ft.

Four Nebraska Tests Near Critical Levels

ST. JOSEPH, Mo.—Skelly Oil Co. may know the results of two more oil tests in the Barada pool of Richardson County, Nebraska, this week. Two edge wells in the Falls City also should be completed soon. One is being drilled at the north edge by Hayden Campbell of St. Joseph and the other is on the east edge, with Towle and Isaccks as operators. A casing collapse caused lengthy delay at the latter test.

Activity is decreasing in the McLouth pool of Jefferson and Leavenworth counties, in Kansas. However, there are various wildcat tests at some distance from the pool.

Oriskany Sand Carries Water In Washington County Well

MARIETTA, Ohio.—The Cambridge anticline test in northern Washington County found water in the Oriskany sand at 174 ft. in the lime. Columbia Carbon Co. 1 Charles Augenstein, Lot 49, Adams Township, logged the top of the lime at 4,258 ft. Oriskany sand 4,432-36 ft.; filled up 1,300 ft. with water, total depth 4,440 ft.; the hole will be plugged back to test a gas showing in the Berea at 1,668-76 ft. Elevation of the test is 802 ft.

Medina County test gets a fair reaction from acid treatment. Lorain County yields a fair gasser gaging 2,500,000 cu. ft. of gas open flow. Muskingum County test dry through the Clinton.

OHIO COMPLETIONS

Ashland County, Perry Township: Hugh Grant Co. 1 John Harpster, Sec. 20, dry, Berea, T.D. 729 ft.

Athens County, Carthage Township: Cromwell et al 1 Myrtle Swartz, Sec. 31, dry, Berea, T.D. 1,620 ft

Licking County, Hopewell Township: Pure Oil Co. 1 Sam Gutridge, Sec. 23, 105 bbl., Clinton 3,006-56 ft., T.D. 3,095 ft.

Mary Ann Township: Ohio Fuel 1 Clara Maharg, Sec. 7, 105,000 cu. ft. gas, shot, Clinton 2,681-2,712 ft., T.D. 2,725 ft.

Lorain County, Columbia Township: Ohio Fuel 1 Herman Snell, Lot 96, 2,500,000 cu. ft. gas, Clinton, T.D. 2,612 ft.

Medina County, Hinckley Township: H. C. Bishop 1 W. and L. Bellus, Lot 55, 160 bbl. in 19 hr. and 600,000 cu. ft. gas, acidized, Little lime 3,150-63 ft., Clinton 3,209-34 ft., dry (previously reported at 125 bbl., natural).

Meigs County, Sutton Township: Roy Proffitt 4 William J. Krider, Sec. 24, 200,000 cu. ft. gas, shot, Ohio shale, T.D. 3,198 ft.; (Berea well deepened).

Morgan County, York Township: Ohio Fuel 1 W. W. Cunningham, Sec. 23, 1,700,000 cu. ft. gas, Clinton 4,264-92 ft., T.D. 4,293 ft.

Muskingum County, Madison Township: S. E. Large et al 1 Martin Echelberry, first quarter, dry, lime 2,690-3,791 ft., Clinton 3,945-79 ft., no Medina, top of Red Rock 4,045 ft., T.D. 4,108 ft.

Newton Township: Atha Oil Co. 1 D. H. Thompson, NW Sec. 18, 5-bbl. pumper, Clinton sand, T.D. 3,475 ft.

Monroe County, Franklin Township: J. E. Lumbatis 5 L. C. Stallings, Sec. 9, dry, Squaw, T.D. 1,528 ft.

Noble County, Seneca Township: S. E. Ruby 1 fee, Sec. 27, 40,000 cu. ft. gas, shot, Berea, T.D. 1,587 ft.

Summit County, Green Township: East Ohio 1 Emma Kepler, Sec. 15, 300,000 cu. ft. gas, shot, Clinton, T.D. 4,469 ft.

East Ohio 1 V. Bender, Sec. 14, 420,000 cu. ft. gas, shot, Clinton, T.D. 4,450 ft.

Washington County, Ludlow Township: Russell Hanlon 3 Emery Allen, Sec. 9, 5 bbl. and 30,000 cu. ft. gas, shot, Berea, T.D. 2,149 ft.

Evansville Pool Opener Makes Good Showing on Pump

EVANSVILLE, Ind.—A production test on pump began last week end at Sells Petroleum, Inc., 1 McCarty, pool opener 2 miles south of Evansville in NE SW NW 32-6s-11w. The hole was full of oil when the test started and from early indications it appeared the well would make 250-300 bbl. of oil in its first 24-hour test. It is producing from the Waltersburg sand at 1,718-36 ft.

NEW WILDCAT LOCATIONS

Pike County: Joe Dawson 2 Patberg, SW NE NE 16-3s-7w.

Joe Dawson 1 Huey Long, SW SW SW 16-3s-7w.

Knox County: Sinclair-Wyoming 1 J. M. Breevoort, SW SW SE 15-2n-11w, due north and across the Wabash River from the All States pool of Lawrence County, southeastern Illinois.

Drilling Again Under Way As M-68 Is Clarified

ASHLAND, Ky.—Clarification of the federal spacing Order M-68, as applying to Kentucky, Ohio, West Virginia, New York, and Pennsylvania has resulted in a brighter scene in the eastern part of this state. While no official comment had been made by the head of any oil or gas firm, unofficial reaction was quite optimistic.

Firms that have been marking time are preparing to move under the terms of the order while companies with expansive drilling operations are proceeding according to the clarification. This has resulted in usual sources of information again making drilling data available.

EASTERN KENTUCKY COMPLETIONS

Pike County: Kentucky-West Virginia Gas Co. operations:

658 J. A. Taylor, 1,713,000 cu. ft. gas, Big lime at 1,476 ft.

5323 S. B. Leslie, Hollybush Branch, 696,000 cu. ft. gas, shale and Big lime at 3,372 ft.

653 Thomas Ratliff, Island Creek, 231,000 cu. ft. gas, shale at 3,245 ft.

5334 James W. Bevins, Slone Branch, 464,000 cu. ft. gas, shale at 3,550 ft.

Martin County: 5337 C. W. Preece, 238,000 cu. ft. gas, Big lime at 3,001 ft.

Floyd County: 5366 F. N. Tackett, Tackett Branch of Mud Creek, 169,000 cu. ft. gas, shale at 2,920 ft.

5373 Cyros Frasure, Mud Creek, 158,000 cu. ft. gas, shale at 2,560 ft.

WESTERN KENTUCKY COMPLETIONS

McLean County, Sebree district: A. V. Smith et al 2 H. Walker, dry, T.D. 575 ft.

Northeast Livermore district: Ellis 1 Mrs. Ollie Shocklee, abandoned location.

Eastern Texas Fields

(Continued from Page 118)

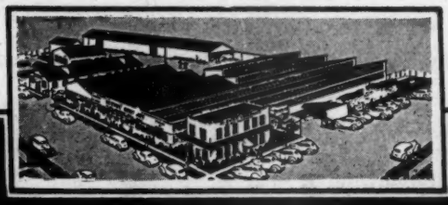
Houston County: W. W. Hincliffe and B. Smith 1 J. Gilmore, N. Wade Sur., 20,000,000 cu. ft. gas, T.D. 5,890 ft.

Fields

Chapel Hill, Smith County: Sun Oil Co. 1 W. Jackson, J. Slaydon Sur., 351 bbl. in 24 hr., 7/8-in. choke, T.D. 8,376 ft.

Hawkins, Wood County: Humble 6-D B. F. Allen, G. Brewer Sur., 322 bbl. in 18 hr., 1/4-in. choke, top Austin 4,140 ft., top Woodbine 4,401 ft., pay 4,620-4,804 ft.

Humble 1 H. C. LaForce, 229 bbl. in 18 hr., 1/4-in. choke, pay 4,620-68 ft., T.D. 4,737 ft.



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Humble 4 W. R. Parrish, 90 bbl. in 24 hr., ¼-in. choke, pay 4,567-4,603 ft.

NEW WILDCAT LOCATIONS

Bowie County: W. B. Hinton 1 J. L. Lumpkin, Wesley Byers Sur., 2 mi. N of Dalby Springs, 1,300 ft. from S and 2,100 ft. from E lines of 740-ac. tract.

Henderson County: Bert Fields and Topaz Oil Co. 1 Alice May, J. P. Tarkington Sur., 330 ft. from NE and 330 ft. from S of river of survey.

Texas 1 E. T. Brown, Armsted Eans Sur., 8 mi. SW of Chandler and NE of La Rue, 1,080 ft. from S and 3,030 ft. from E lines of 826-ac. tract.

California Fields

(Continued from Page 102)

Co. 1 Rogers-Jones, 35-26s-27e, dry, T.D. 2,924 ft., top of Vedder zone of Miocene age 2,892 ft.

Tupman, Kern County: Richfield 36-27-C Kern County Land, 27-30s-25e, flowed 2,400 bbl., 32.6-gravity, 1 per cent cut, 2,200,000 cu. ft. gas, two 96/64-in. beans, pressures 950/1,850 lb., T.D. 9,390 ft., perf. 9,144-9,385 ft., N point 8,899 ft., completed in Stevens oil sand of Miocene age.

Union Avenue, Kern County: Richfield 2 Union Avenue, 6-30s-28e, pumped 45 bbl., 15.7-gravity, 10 per cent cut, T.D. 5,340 ft., P.B. 5,200 ft., perf. 4,231-35 ft., 4,628-48 ft., 4,673-95 ft., 4,718-21 ft., 4,955-70 ft., 4,990-5,020 ft., 5,100-20 ft., completed in lower zone of probable Miocene age, upper zone 4,240 ft.

Second Deep Producer In Ventura Avenue

Tide Water Associated Oil Co. broke all existing records for deep production in the Ventura Avenue field early this week but Shell turned around a few days later and exceeded the depth reached by Associated. Tide Water Associated's new well was 18 McGonigle which was completed at 11,350 ft. flowing 442 bbl. of 29.6-gravity oil daily. Shell went 166 ft. deeper with 1-A Shell-Lloyd and brought it in flowing at the rate of 1,394 bbl. per day of 31.1-gravity oil and 1,260,000 cu. ft. of gas from 11,516 ft. The bit was still in the pay when drilling operations were concluded and for this reason this zone may prove of considerable importance. No operator has drilled entirely through the Pliocene in the Ventura Avenue field and it looks like it may be a long time before this event is reached because there may be 15,000 ft. of Pliocene sediments above the Miocene. Shell's deep producing well failed to produce very much higher up in the hole but the added depth changed a small well into an excellent flowing well. This is a tribute to Ralph Lloyd who always believed the deep sand would be found in the east end of the Ventura Avenue field.

COASTAL DISTRICT COMPLETIONS

Santa Maria Valley, Santa Barbara County: F. Burgdorfe 1 Holmes, 26-10n-34w, pumped 350 bbl., 15.8-gravity, 5 per cent cut, T.D. 5,002 ft., completed in Monterey formation of Miocene age, top Miocene 4,775 ft.

Capitol Co. 3 MacDonald, 28-10n-34w, pumped 201 bbl., 14.6-gravity, 7 per cent cut, T.D. 5,310 ft., perf. 4,880-5,310 ft., completed in Monterey formation of Miocene age.

J. W. Lee 1 T. G. & T. Co., 33-10n-33w, dry, T.D. 3,503 ft., 180-mesh perf. 2,403-3,280 ft., swabbed sulfur water, no oil.

Ventura Avenue, Ventura County: Associated 18 McGonigle, 23-3n-23w, flowed 442 bbl., 29.6-gravity, 3 per cent cut, 377,000 cu. ft. gas, 60/64-in. bean, pressures 100/2,200 lb., T.D. 11,350 ft., perf. 10,-714-11,350 ft., completed in lower zone of Pliocene age.

Associated 55 V. L. & W., 23-3n-23w, flowed 832 bbl., 32.6-gravity, 0.7 per cent cut, 690,000 cu. ft. gas, 32/64-in. bean, pressures 300/1,000 lb., T.D. 10,-750 ft., perf. 9,910-10,517 ft., completed in intermediate zone of Pliocene age.

Shell 39 Edison, 21-3n-23w, flowed gas lift 503 bbl., 29.5-gravity, 10 per cent cut, 760,000 cu. ft. net formation gas, T.D. 9,760 ft., perf. 8,812-9,182 ft., 9,223-9,464 ft., 9,504-9,710 ft., completed in intermediate zone of Pliocene age.

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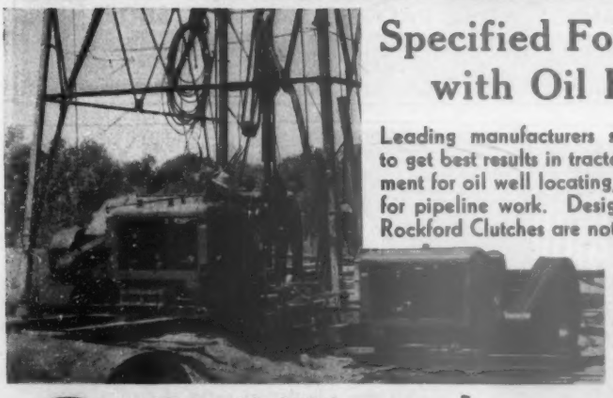

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BOOKS

HANDBOOK OF PHYSICAL CONSTANTS. Edited by Francis Birch, J. F. Schairer, and H. Cecil Spicer, Geological Society of America, 419 West 117th Street, New York. 325 pages.

Much of the material contained in this volume is of fundamental importance to geophysicists. It was prepared as the outcome of a resolution of the Interdivisional Borderlands Committee of the National Research Council and was prepared by geologists, physicists, and chemists. The scope of the work, which consists almost wholly of tables can best be shown by a recital of the table of contents as follows: Composition of igneous rocks, stony meteorites, and iron meteorites; density at room temperature and one atmosphere; density at high temperature, thermal expansion; density at high temperature, compressibility; elasticity (except compressibility); internal friction in vibrating solids; seismic velocities; geodetic constants, data concerning the interior of the earth; strength and plasticity; viscosity; melting and transformation temperatures of minerals and allied substances; effect of pressures on temperatures of melting and of solid-solid equilibrium in systems with one component; effect of pressure on phase equilibria in binary condensed systems; temperature-pressure-volume and phase relations of water; aqueous inorganic salt solutions at high temperatures; heat capacity, heat of fusion; thermal conductivity and diffusivity; radioactivity, the earth's heat and geological age measurements; observed temperatures in the earth's crust; magnetic properties of rocks; electrical properties of rocks and minerals.

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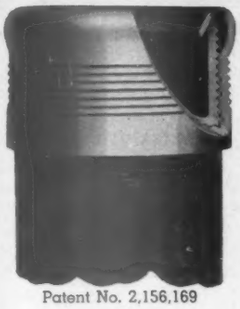

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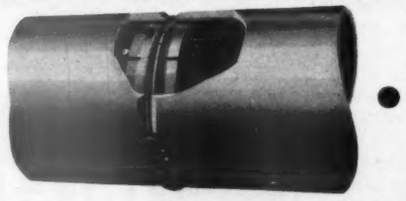

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Oil-Shale Development May Be Possible at This Time

(Continued from Page 96)

deducted a credit of an average of 30 cents or more per barrel for the recovery of the shale counterpart of natural gasoline and also the usable B.t.u.'s contained in excess noncondensable fixed gases from the shale.

"Unquestionably at the present-day costs the vaporized retort gases would not be condensed into crude shale oil but would be led directly into a catalytic or other modern refining system. The saving of revaporization costs is not included in the above figures.

"Although western oil shales contain beds of substantial thickness which run more than 1 bbl. of producible oil per ton, the above analysis is based upon the use of shale beds containing on the average ½ bbl. or less of oil per ton mined. Shale of this average richness may be had in great thicknesses, and, as outlined above, is susceptible of great economies in mining. Much larger total recovery of oil per acre under these methods is an important but not the motivating consideration in the above procedure.

"While both the Bureau of Mines and Mr. Catlin discovered that the daily throughput capacity of an oil-shale retort varies inversely with the richness of the shales used, the above retorting costs include 50 per cent more retorting capacity, with the necessary increase in labor for ½ bbl. of shale, than Mr. Catlin used for 40-gal.per-ton shale. It is probable that this capacity is substantially in excess of that actually needed.

"A fact which is not generally known and which does not appear in the bulletins of the Bureau of Mines written on the subject is that shale oil cracks with greater-than-average ease into naturally high antiknock products. This fact was stated to me many times by the Bureau of Mines technologist, who for years was in charge of the cooperative laboratory jointly financed by the Bureau of Mines and the State of Colorado, at Boulder, Colo.

"Obviously the above-enumerated facts at least raise a question as to whether the often-repeated statement that "oil from shale must wait upon much higher prices" reflects the true facts. However, utilization of any of these (resources) would require development which would take many years and a capital investment comparable to the total now invested in the oil industry.

"A corollary of this statement is that if construction of shale-oil plants were begun immediately it would be many years before enough production could be attained to create a ripple in the present tremendous total requirement of oil products, not to mention future demands. The price for these products will be governed for decades by pool petroleum. Even if we assume, although it is not beyond question, that increased exploration will reverse the present declining rate of discovery of reserves, is it not also true that increased costs will be an unwelcome companion? Then is it not vital to the public welfare that a young shale-oil industry, able to care for itself from the start, should be begun in time to carry at least part of the load at such time as supplemental production is vital? If neglected until that day shale-oil production could not be developed fast enough to mitigate the hardships of an acute shortage.

"It would seem to be far more desirable for the manufacture of shale oil to be initiated by the oil industry itself; but, from the point of view of national safety and public welfare, if the oil industry itself is unwilling to make this beginning it might be desirable for it to be made by means of a federally financed operation rather than be longer delayed.

"Oil shale has been the subject of an interesting and peculiar psychology. The victim of a premature boom in the early 1920's, its value in the public mind and also in that of the oil industry fell to an unwarranted but understandable low during the discovery of the tremendous flush fields which followed, and the depression of the 1930's. With conditions as they now appear to be within the oil industry in relation to the discovery of new reserves, and consumption increases, it is not too early for the actual and apparently little known facts in connection with the production of oil from shale to become better known and more accurately appraised."

Mr. Slusser was associated with early oil-shale developments, having acquired some 2,000 acres of mining locations as early as 1919. He is at present employed as an officer in the Internal Revenue Service.

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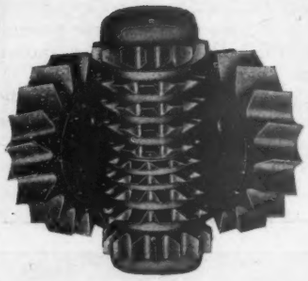

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Among the Drilling

LEE Drilling Co. is moving in for a test to be drilled jointly with Herman Hurst as an extension to the Tecumseh Lake field, Pottawatomie County, Oklahoma.

R. H. CROW, president, Crow Drilling Co., Shreveport, La., has assumed the drilling obligation for a 6,000-ft. wildcat to be drilled on the north flank of the Sligo field, 5 miles southeast of Shreveport, Bossier Parish, Louisiana. Associated with him are Ward Delaney, independent operator, and M. W. Grimm, geologist.

CRESCENT Drilling Co., Shreveport, La., has been granted contract and is moving in rig for a wildcat test to be drilled for A. C. Taylor on a 1,500-acre block in Hempstead County, Arkansas, approximately 3 miles northeast of the new Midway field, Lafayette County. This is the first location in Hempstead County as an extension of that new strike.

H. R. BURDEN, Kilgore, Tex., has contracted to drill a 4,500-ft. Woodbine sand test for Ward Delaney, Shreveport, La., oil man, on the Birmingham Development Co. property, B. Newton Survey, 4½ miles northeast of Rusk, Cherokee County, Texas.

OLSON Drilling Co., Tulsa, is drilling a joint deep test with Moore Exploration Co., on the east flank of the Yates field, Pecos County, Texas, and a mile west of the discovery well in the shallow Noelke area, western Crockett County, Texas.

HELMERICH & PAYNE, Inc., Tulsa, are the contractors on the 6,500-ft. test being drilled by Moncrief and associates on the Couch land, Crockett County, West Texas.

NOBLE Drilling Co., Tulsa, is drilling a deep test for Amerada Petroleum Corp., a mile north of production of the Todd field, northern Crockett County, Texas.

BRAHANEY & BOSWORTH, Odessa, Tex., are the contractors on Big Lake Oil Co.'s 19-C University, completed the past week as the discovery well of a new and fourth producing horizon for the Big Lake field, Reagan County, Texas. The well was started as an 8,500-ft. test of the Ellender, but finding production at 4,355 ft., a previously untested horizon, was stopped there, with bottom of hole 4,381 ft.

POHLAND Drilling Co. is drilling two cable-tool tests for Humble Oil & Refining Co. in the Lancaster (Clara Couch) shallow Permian producing area, near Sheffield, Crockett County, West Texas.

MAX CONREY, Centralia, Ill., is moving in tools to drill a test for Blankenship & Randsdell in 11-4s-1w, Perry County, Illinois.

CROSS & JOHNSON Drilling Co., Odessa, Tex., has been awarded contract to drill a test for Mascho Oil Co. on the Sun-University tract, northwest of the Emma pool, Andrews County, Texas. Contract is for 4,600 ft.

BUTLER & HORNE Drilling Co., Dallas, Tex., is attempting to complete its 4-A Wimberly, north extension to the Wimberly pool, Jones County, Texas. The test was drilled to 2,571 ft. but was plugging back to showings encountered at 2,438-78 ft.

UNGREN & FRAZIER, Abilene, Tex., have contracted to drill a wildcat test for Lewis Production Co. on the Minter estate, 2½ miles northeast of the Guitar pool, Jones County, Texas. Rig is being moved in.

MORRIS & HAMILTON, Houston, Tex., is drilling an 8,500-ft. contract wildcat test for Lockhart Oil Co. on the Sweeney estate in the Alamo-Donna block, southern Hidalgo County, Texas.

I. R. McQUEEN, Oklahoma City, Okla., is the contractor on the wildcat test to be drilled by B. F. Lundy and Warren Shear, Duncan, Okla., in 21-1s-7w, 4 miles southeast of Duncan, Stephens County, Oklahoma. Contract is for 5,000 ft.

NICKLOS Drilling Co., Houston, Tex., opened production from a new sand on the southeast flank of the Pine Prairie dome, Evangeline Parish, Louisiana, with the completion of E. J. Nicklos 2 Reed, completed in a new sand at 7,700 ft. for an initial production of 780 bbl. daily through a ¼-in. choke. Another rotary is located in the Horseshoe Bayou field, St. Mary Parish, for the Texas Co.

SUMMIT Drilling Co., Tulsa, is drilling a Wilcox sand test on a 1,280-acre block east of Mulhall, Okla. This is a joint test in which the contracting company has an interest with E. S. Adkins, Gardner Petroleum Co. et al.

RICHMOND Drilling Co., Odessa, Tex., has reported a showing of gas from 3,650-70 ft. in a wildcat test being drilled jointly with Ray Albaugh in League 1, 4 miles west of Lamesa, Dawson County, Texas.

JOHN COATS, Gladewater, Tex., has moved in rig for a 6,250-ft. contract test for D. V. Davis, Atlanta, Tex., on the Morris Shepherd estate land, in the B.B.B.&C. Survey, 5 miles north of Naples, northern Morris County, Texas. Rig was moved from a temporarily abandoned wildcat drilled for W. T. Saye in the Blocker Community, Harrison County, Texas.

GLENN H. McCARTHY, Houston, Tex., was attempting to extend Wilcox sand production in the new Magnolia field, Montgomery County, Texas, as preparations were being made to test his 1 Tucker, located about 1 mile southwest of the dis-

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covery well. The well is bottomed below 10,000 ft. at which depth casing was cemented. In the meantime, drilling continues below 11,000 ft in his 1 Munson, a wildcat located in the Bailey's Prairie area, Brazoria County, Texas. Two other operations are reported in the Stowell field, Chambers County, Texas, both of which are expected to extend production several hundred feet.

CROW Drilling Co., Shreveport, La., has the contract for a working interest in a test being drilled by Franco-Central Oil Co., Wichita, Kans., 2½ miles northeast of the Otis field, Barton County, Kansas. Rotary tools have been moved in.

HARRY L. EDWARDS Drilling Co., Houston, Tex., opened gas-distillate production on the Thornwell prospect, Jefferson Davis Parish, coastal Louisiana, with the completion of Cities Service 1 Lacassine, which is flowing gas and distillate from perforated casing opposite sand at 9,600 ft.

BREWSTER-BARTLE Drilling Co., Houston, Tex., has logged interesting showings in two important wildcats located in Harris and De Witt counties, Texas. North of Houston, about 15 miles, showings were logged at intervals from 6,690-7,210 ft. in George Strake 1 Phoenix Dairy, and drilling continues below 7,234 ft. East of the town of Yorktown, De Witt County, gas sand was recovered in cores from 7,075-7,129 ft. in Adams Oil & Gas Co. 1 Berck. The showings were logged in the Carrizo, and the well is expected to reach the Wilcox sand by the first of the week. Another rotary is located in La Salle County, Texas, where another Wilcox test is being drilled for the Navarro Oil Co.

BODINE Drilling Co., Great Bend, Kans., has spudded for a well contracted for Skelly Oil Co. on the Armbrust tract, ½ mile west of the Kraft (Arbuckle) pool, Barton County, Kansas.

DELTA Drilling Co., Tyler, Tex., has started a test for its own account in the north end of the Chapel Hill field, eastern Smith County, East Texas. Location is on the Jim Walton tract, Stilwell Box Survey.

ALLEN & MORRIS, San Antonio, Tex., continues to drill ahead in Shield Oil Co. 1 Heard, a prospective pool opener 2 miles southeast of the Heard field, Bee County, Texas, and additional showings were logged during the week. Drill-stem testing at intervals from 4,854-98 ft. tested several hundred pounds of working pressure and some oil-cut mud. Other drilling operations are reported in Jim Wells, Nueces, San Patricio and Refugio counties, Texas.

MERCURY Drilling Co., Tulsa, drilling for and jointly with N. Appleman Co., Wichita, Kans., has opened a new siliceous lime pool in 24-17s-10w, approximately a mile west of the Wilkins pool, Ellsworth County, Kansas. These operators own jointly 480 acres in the block on which the well was drilled. Before acidizing the well filled up 9 bbl. an hour of 46° A.P.I. oil, with no water showing. Further testing awaits tankage.

FALCON-SEABOARD Drilling Co., Houston, Tex., is rigging up in the Tepetate field, Acadia Parish, Louisiana, for a projected deep test to be drilled for Vincent & Welsh. Drilling was expected to be started on another test in the Gibson field, Terrebonne Parish, Louisiana, for the Shell Oil Co., Inc., following the completion of 8 Realty Operators. In the meantime, two rigs are running in the active Midway field, Lafayette County, Arkansas, for Barnsdall Oil Co., while in West Virginia, a projected deep test is being started for the Hope Natural Gas Co.

HOLLOW Drilling Co., Inman, Kans., will manage and operate all the oil properties owned by the Bridgeport Machine Co., under an arrangement completed last week. Bridgeport acquired all the issued and outstanding stock in the Hollow company which is headed by F. H. Hollow, who is also president of Bridgeport.

HARRY L. EDWARDS Drilling Co., Houston, Tex., has taken over a wildcat test started for Earl Hankamer and associates 5 miles north of the new Stowell field, Jefferson County, Texas.

Inventory of Drilling Rigs by Contractors

With a view toward determining the equipment needs of the drilling industry for next year, the American Association of Oil Well Drilling Contractors is undertaking to make a confidential inventory of every string of drilling tools in the country. The inventory is expected to make it easier to obtain necessary equipment and replacements than would be possible with just a questionable estimate of the number of rigs. Also it is expected to be valuable in determining location and availability of drilling rigs.

Drilling Contractors Asked To Salvage Scrap

The American Association of Oil Well Drilling Contractors has issued a special request for drilling contractors to salvage all scrap materials that might be of value during the present emergency. Officers of the association state that the collection of all metals and rubbers, pump valves, old rubber ring packing, swivel wash pipe, and all other metal or rubber left over from expendable supplies, is especially desirable. Tool pushers going back and forth between the yard and locations are urged to haul what old materials they can in their cars.

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WEB WILSON Oil Tools
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HUNTINGTON PARK, CALIF.

Offsets to Midway Discovery Well Near Completion

SHREVEPORT, La.—Four offsets to Barnsdall 1 Bond were in the pay at the end of the week. Barnsdall 1 Dobson, SE NE 10-15-24, a northwest offset, had top of saturation at 6,417 ft., or at an elevation of —6,124 ft. compared with —6,032 ft. in the discovery. It was drilled to 6,522 ft. where casing is being set. Barnsdall 2 Bond, SW NW 11-15-24, a north offset had the top of the pay at 6,424 ft. (elevation —6,142 ft.), drilled to 6,531 ft. and set pipe. It is waiting on cement preparatory to perforating and testing.

The west offset, Arkansas Fuel 1 Creek, NE SE 10-15-24, found saturation at 6,421 ft. (elev. —6,152 ft.) and penetrated 73 ft. of saturation to 6,494 ft. where casing has been set. Roberts 1 Bond, NE SW 11-15-24, east of the discovery, had the top of the pay at —6,070 ft. and was coring at 6,454 ft.

Northwest of 1 Dobson in NW NE 10-15-24, Normandie et al 1 Burns was still in shale at 6,313 ft. and northeast of 2 Dobson in NE NW 11-15-24, Magnolia 1 Johnson was also in shale at 6,370 ft. The south offset to the discovery, Barnsdall 3 Bond, was in shale at 6,190 ft. These three wells, particularly the Burns well, are being watched with great interest as the drop from the discovery, especially to the northwest and west is abnormally steep for Arkansas structures. This may be due to several causes, such as local faulting or deep erosion of the Smackover lime surface giving rise to local irregularities, rather than a restriction in the area of the field.

ARKANSAS

COMPLETIONS

Stephens, Columbia County: R. H. Crow 1-C J. W. Smart, NW SW 12-15s-20w, dry at 3,447 ft.
Baily Johnson et al 1 Smart, SW NW 12-15s-20w, dry at 1,118 ft.
McKamie, Lafayette County: Atlantic 9 Bodcaw, 100 ft. N of C NE 33-17s-23w, dry at 9,623 ft.

New Wildcat Locations

Hempstead County: Hy-Grade Oil Co. 1 Copeland, NW NW 32-14s-23w.
Phillips County: John C. Liming 1 Watkins, SW SE 7-1s-3e.

North Lisbon Test Reaches Record Depth

The first test in the Shreveport area to go below 12,000 ft. is Union Producing Co. 1 McDonald, C SW 13-21n-5w, North Lisbon, which was reported below 12,132 ft. It had shown gas-distillate production in the Smackover lime at 11,870-72 ft. and at latest reports was still in the Smackover lime.

Haynesville's Pettit zone had its fourth producer as Ohio 1 Bond was completed for 5 bbl. an hour through 17/64-in. choke. The Louisiana Conservation Commission placed Haynesville-Pettit production on an 80-acre basis and five tests which were drilling on a 40-acre basis were given 30 days in which to expand or shut down. The spacing is on alternate ends of long 80's so that if desirable the other 40's can be drilled later.

NORTH LOUISIANA

COMPLETIONS

Wildcats

Catahoula Parish: Sinclair Prairie 1 Tensas Delta, NE SE 6-7n-5e, top Vicksburg 849 ft., Moodys Branch 1,271 ft., Cockfield 1,290 ft., Cook Mountain 1,916 ft., Sparta 2,053 ft., Cane River 2,778 ft., Wilcox 2,984 ft., Midway 5,593 ft., dry at 6,020 ft.
La Salle Parish: H. L. Hunt 123-F Goodpine, NE SE 29-7n-3e, 24 bbl., 5,395 ft.
Winn Parish: H. L. Hunt 72-F Goodpine, NE NE 19-10n-4w, dry at 6,302 ft.

Fields

Sligo, Bossier Parish: Triangle Drlg. Co. 4-A Kerr unit, SE NE 24-17n-12w, 75 bbl., 3,154 ft.
Caddo, Caddo Parish: Bayou State Oil 3-B Stiles, SW SW 22-21n-16w, 10 bbl., 1,044 ft.
A. P. Gilbert 1 Bell, NE SE 34-22n-16w, 631 bbl., 2,470 ft.
W. L. Newton, trustee, 1 Stiles, SW NW 32-21n-16w, dry at 1,723 ft.
Larto Lake, Catahoula Parish: Phillips-Carter 4-B Tensas Delta, SE SE 14-5n-5e, dry at 5,265 ft.
Haynesville, Claiborne Parish: Ohio Oil 1 Bond Acct. 2, NW NE 21-23n-8w, 840 bbl., 5,370 ft.
Nebo, La Salle Parish: H. L. Hunt 75-F Goodpine, SE SE 16-7n-3e, 141 bbl., 4,116 ft.
H. L. Hunt 76-F Goodpine, NE NW 22-7n-3e, 139 bbl., 4,087 ft.
H. L. Hunt 77-F Goodpine, NE SE 21-7n-3e, 176 bbl., 4,127 ft.
South Olla, La Salle Parish: Peterson Pet. 4-B Tremont, SE SW 25-9n-2e, dry at 4,105 ft.

New Wildcat Locations

Bossier Parish: R. H. Crow 1 Wheless, SW NE 20-18n-12w.
Claiborne Parish: C. C. Snyder 1 Kennedy, SE SW 9-22n-4w.
Natchitoches Parish: H. L. Hunt 23-F Goodpine, SW NW 12-13n-7w.

MISSISSIPPI

New Wildcat Locations

Sharkey County: E. C. Johnson and Sam Cook 1 Klaus, NE NE NE 19-11n-7w.

COMPLETIONS

Tinsley, Yazoo County: L. A. Glover 1 Susan Cessna, NW SE 7-10n-2w, pumping 40 bbl. oil and 700 bbl. water in 24 hr., T.D. 5,642 ft.

Technical Services, Ethyl Gasoline Corp., Merged Under J. J. Frey

ALL technical services of Ethyl Gasoline Corp. have been merged into a single unit which will function in close cooperation with the Government, and with the petroleum and automotive industries. A war committee to adapt research facilities to the needs of the armed forces has been formed.

J. J. FREY *W. H. HUBNER* *J. C. POPE*

Julian J. Frey, Detroit, Mich., head of the company's technical sales division since 1930, has been appointed director of the new department and chairman of the war committee. The department includes the company's gasoline-testing division, of which John Clifford Pope will be manager, and the refinery technology division, headed by William H. Hubner.

The testing division will continue to provide sample inspection service for the company's customers, and to make periodical surveys of the quality of fuels marketed throughout the country. The refinery technology division will broaden its services to aid refiners in attaining the most economic use of tetraethyl lead.

Other divisions embraced in the new department, and their heads are: Bus and truck, Errol J. Gay; passenger car and automotive accessories, Richard K. Scales; agricultural, C. G. Krieger. Members of the war committee, in addition to Chairman Frey, are: Earl Bartholomew, Dr. George Calingaert, Dr. Graham Edgar, S. D. Heron, Dr. O. E. Kurt.

Ethyl's wartime research problems will be dealt with by a committee composed of representatives of the manufacturing department and of aeronautical, engineering, and chemical research. The members of this committee are: Mr. Bartholomew, Dr. Harold A. Beatty, Dr. Calingaert, Dr. Edgar, C. D. Hawley, Mr. Heron, Dr. Kurt, John Lachowicz, M. W. Manchester, and John Schaefer.

Transportation Jam Forcing Drastic Oil-Traffic Action

(Continued from Page 36)

urgently needed for other purposes. He said that was WPB's job.

In his press conference, Coordinator Ickes reiterated the declaration that current events have shown that both the national-defense line and the record rail movement by tank cars would no more than meet the current deficiency in transportation of petroleum to the East Coast.

There is a possibility that dislocation of transportation facilities, including diversion of tank cars from the Middle West area to East Coast services and the other ramifications may force rationing of petroleum products on a national basis. This possibility was pointed out by Coordinator Ickes in his remarks last week when he briefly sketched what may become necessary in supplying the vital war industries in the East Coast district with the fuel necessary to keep their plants in full production. He said he could not be certain without a more detailed survey but that diversion of 5,000 to 10,000 tank cars from the Middle West, roughly 15 per cent of the total serving that area, might create transportation shortages in an entirely different area. Any reversal of pipe-line flow from the normal east-west service may also create disturbances, particularly if accompanied by and simultaneous with a diversion of tank cars. The coordinator said that members of the OPC and OPA staffs already have worked out most details of a rationing plan.

The immediate result of the sharp reduction in coastwise movement of petroleum from the Gulf Coast to the East Coast has been imposition of pipe-line proration in several Texas areas. Action of Atlantic Pipe Line Co. earlier this month in reducing crude runs from leases to which it is connected was followed late last week by even more drastic cuts by other purchasers.

Humble Oil & Refining Co., largest purchaser of Texas crude, reduced its runs from West Texas and New Mexico fields by 40 per cent, except in the Yates field of Pecos County and the World field of Crockett County, where full allowables will be accepted because of the high-octane gasoline content of those crudes. There were no exceptions among New Mexico fields. Humble's purchases in Southwest Texas fields were reduced

50 per cent, effective February 21, the same date of the West Texas retrenchment. Fields excepted in the Southwest Texas district because of the high-octane gasoline content of their crude are Agua Prieta, Alice, Ben Bolt, Blanchard, Bridwell, Bruni, Colorado, Fitzsimmons, Kelsey, Benavides, Tesoro, Tom Graham, Flour Bluff, East Flour Bluff, Bird Island, La Rosa and Washburn.

Texas-New Mexico Pipe Line Co., effective February 19, reduced its purchases in West Texas and New Mexico by 65 per cent. Texas Pipe Line Co., operating a line out of the Panhandle, discontinued crude purchases, turned its connections to other buyers and announced that its facilities would be converted to transportation of gas.

In making its announcement, the Humble company said that reductions were forced by the extraordinary situation incident to the war which had brought about acute shortage of tankers resulting in accumulation of excessive stocks of certain grades of crude, taxing its limited storage facilities. The company pointed out that the reduction in purchases did not meet its problem in full and that conditions are changing so rapidly that it was impossible to make an accurate forecast for an extended period. Other changes in its program may be forced from time to time, the company statement added.

Permian Basin, Panhandle Fields

(Continued from Page 98)

Slaughter, Hockley County: Falcon 2 Gant, 480 bbl., 10,000 gal. acid 4,917-46 ft.
Magnolia 20-B Mallett, elev. 3,620 ft., 1,437 bbl., 3-in. casing outlet, 10,500 gal. acid 4,980-5,040 ft.
Magnolia 8-C Mallett, elev. 3,633 ft., 1,313 bbl., 3-in. casing outlet, 10,500 gal. acid 4,991-5,025 ft.
Magnolia 13-F Mallett, elev. 3,590 ft., 1,745 bbl., 3-in. casing outlet, 10,500 gal. acid 4,964-5,025 ft.
Magnolia 2 Owen, elev. 3,567 ft., 615 bbl., 4,500 gal. acid 4,934-5,036 ft.
Stanolind 25-A Slaughter, elev. 3,521 ft., 146 bbl., 22/64-in. choke, 4,000 gal. acid 5,015-65 ft., T.D. 5,085 ft.
Texas 17-B Mallett, elev. 3,576 ft., 833 bbl., 12,000 gal. acid 4,962-5,026 ft.
Texas 23-F Mallett, elev. 3,596 ft., 1,184 bbl., 14,000 gal. acid 4,980-5,035 ft.
Texas 96 Slaughter, elev. 3,560 ft., 1,678 bbl., 12,000 gal. acid 4,968-5,012 ft.
Texas 97 Slaughter, elev. 3,542 ft., 2,026 bbl., 13,000 gal. acid 4,940-5,015 ft.
Texas 101 Slaughter, elev. 3,567 ft., 1,424 bbl., 12,000 gal. acid 4,960-5,022 ft.
Texas 102 Slaughter, elev. 3,541 ft., 1,248 bbl., 12,000 gal. acid 4,965-5,020 ft.
Texas 103 Slaughter, elev. 3,551 ft., 1,248 bbl., 13,500 gal. acid 4,960-5,025 ft.
Western States 16 Frazier, elev. 3,519 ft., 1,869 bbl., 3-in. casing outlet, 10,000 gal. acid 4,920-5,005 ft.
Slaughter, Terry County: Gulf 13 Mallett, elev. 3,510 ft., 1,517 bbl., 10,000 gal. acid 4,995-5,015 ft.
Wasson, Yoakum County: American Liberty 3 Elliott, elev. 3,648 ft., 300 bbl. oil and 19 per cent water, 10,500 gal. acid 5,030-5,238 ft.
Drilling & Exploration Co. 2-A Stanford, elev. 3,677 ft., 406 bbl., 1/8-in. choke, 9,000 gal. acid 4,875-5,125 ft.

NEW WILDCAT LOCATIONS

Gaines County: J. F. Postelle 1 M. S. Doss, Lynn C.S.L. Sur., Blk. 293, Lbr. 16, SW SW of section, 5,300-ft. rotary test.

SOUTHEAST NEW MEXICO

The North Grayburg pool of Eddy County has been extended 1½ miles east by the L. H. Choate and C. W. Brown 1 Hoover-State, in 2-17s-30e. The well flowed an estimated 150 bbl. through casing after shooting at 2,903-78 ft. Operators were building road for 2 Hoover-State, a west offset.

SOUTHEAST NEW MEXICO COMPLETIONS

North Grayburg, Eddy County: Sanders Bros. 3 Evans, 4-17-30, flowed 260 bbl. through 2-in. tubing, pay 2,937-70 ft., shot, T.D. 2,970 ft.
Sanders Bros. 2 Evans, 4-17-30, flowed 60 bbl. through 2-in. tubing, shot, pay 2,937-66 ft.
Grayburg, Eddy County: Aston & Fair 4 Hudson, 17-17-31, flowed 52 bbl., shot, 3,381-3,500 ft.
Arrowhead, Lea County: Gulf 4-C Leonard, 36-21-26, flowed 267 bbl. 35.5° oil, ½ to ¾-in. chokes, with 603,000 cu. ft. gas, natural, 3,730-3,825 ft.
Maljamar, Lea County: Barney Cockburn 3-B Miller, 23-17-32, shot, pumped 35 bbl., T.D. 3,874 ft.
South Lovington, Lea County: Stanolind 8-E State-18, flowed 78 bbl. through tubing choke, T.D. 4,980 ft.

WILDCAT LOCATIONS

Eddy County: Neil H. Wills 1 Wills, NW SW 13-20-28, 4 mi. W of Getty pool.
P. B. English 3-A Daugherty, SE SW 3-17-27, Red Lakes district.
Lea County: Mascho and American Drlg. Co. 1 Tide Water-State, NW 18-12-35, 7 mi. W of Tatum.

TEXAS PANHANDLE

AMARILLO, Tex.—Drilling operations in the Panhandle field have been cut steadily since January 1, with 52 operations reported last week compared with 150 active wells the first of the year. Eleven locations were staked the week ending February 21, eight of which were in Hutchinson County and three in Wheeler. There were no first reports for Carson, Gray and Moore counties.

The Devore-Slade and Gourley wildcat, northeast of Tulia in Swisher County, was again active with the crew bailing out preparatory to running 8-in. pipe to bottom at 4,001 ft. The well has been shut down for some time due to the shortage of casing. Contract depth of the well is 5,000 ft. but it may be drilled to 5,500 ft.

TEXAS PANHANDLE COMPLETIONS

Carson County: Cities Service 46 Burnett "A," Sec. 32, Blk. 4, I.&G.N. Sur., 39,000,000 cu. ft. gas, 2,525-2,640 ft., R.P. 336 lb., T.D. 2,651 ft.
Gray County: Hagy, Harrington & Marsh 1 Sheridan, Sec. 214, Blk. B-2, H.&G.N. Sur., acidized and flowed 5,600,000 cu. ft. gas, 2,780-2,915 ft., R.P. 347 lb., T.D. 2,975 ft.
Tharp & Smith 4 Short, Sec. 2, Blk. 1, H.&G.N. Sur., shot and pumped 56 bbl. in 4 hr., 2,900-70 ft., T.D. 2,984 ft.
Hutchinson County: Continental Oil 4 Sanford "C," Sec. 79, Blk. 46, H.&T.C. Sur., pumped 195 bbl., 2,787-2,800 ft., T.D. 2,805 ft.
Shell Oil 42 Harvey "B," Sec. 14, Blk. M-21, T.C.R.R. Sur., pumped 307 bbl., 3,024-90 ft.
Shell Oil 3 Terry, Sec. 15, Blk. M-21, T.C.R.R. Sur., pumped 250 bbl., 3,030-90 ft.
Moore County: Canadian River Gas 4-A Kilgore, Sec. 12, P.Mc. Blk., E.L.R.R. Sur., 7,500,000 cu. ft. gas, 3,244-3,625 ft., T.D. 3,648 ft.
Phillips 1 Loula, Sec. 208, Blk. 3-T, T.&N.O. Sur., 24,500,000 cu. ft. gas, 2,810-3,090 ft.

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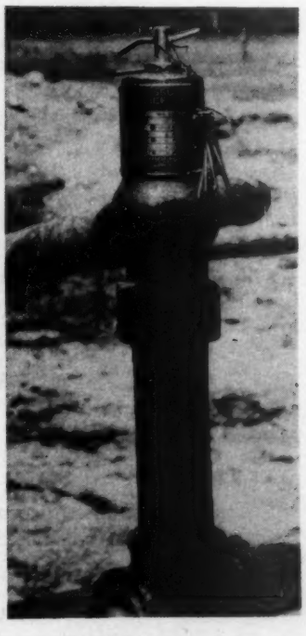

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Personal Paragraphs

WALTER E. HELMICK, engineer in Shell Oil Co., Inc., field department for several months at Long Beach, Calif., has been transferred as engineer to the company's pipe-line department and will maintain offices in Los Angeles, Calif.

W. E. WALLIS, of the foreign exploration staff of Standard Oil Co. of New Jersey, has been transferred to the Costa Rica headquarters of the company effective next month. He is now visiting points in the Mid-Continent. Mr. Wallis returned to the United States in October from Egypt, where he was engaged in geological work.

MAJ. ROY A. HURT, of Burlington Oil Co., Mission, Kans., is now at Huntsville Arsenal, Huntsville, Ala.

BART DeLAAT, assistant chief production engineer, Pure Oil Co., Chicago, was married on March 14 to Miss Mary Kathryn Kimball, at Bushnell, Ill.

ELMO J. PATTISHALL, roustabout first class, Continental Oil Co., has been promoted to head roustabout, production department, western Kansas district.

T. W. MITCHELL, a light-oil treater at the Ponca City, Okla., refinery of Continental Oil Co., has been placed on the retired list after spending 17 years with that concern and 40 years in the industry.

W. J. PRICE, drilling superintendent, Columbian Petroleum Co., Barco concession, Colombia, for the past 5 years, has completed a vacation in the United States and is awaiting call to army service at Fort Sill, Oklahoma.

O. M. MYERS, mechanical and petroleum engineer of Shawnee, Okla., is preparing to leave shortly for Abadan, Iran, where he will assist in building some new plants at refineries there. Mr. Myers only recently came home from service on a new refinery in Canada.

G. E. WYNN has been named assistant general superintendent of Mid-Continent Petroleum Corp., Tulsa. Mr. Wynn, who has been superintendent of the company's planning and development department, will assume his new duties immediately in the office of G. GLENN MORGAN, general superintendent of the refinery.

J. L. (JACK) DELLINGER, manager of Etexas Producers Gas Co., organized Tyler's first Winter Sports Carnival during the recent cold wave. Finding smooth ice on a viaduct near town one morning, Mr. Dellinger, a former Dartmouth hockey star, had the carnival announced in all school rooms. By afternoon he had badges and ribbons for the judges, prizes for the winners of the children's skating and sledding events, hot-dogs and cocoa for all. Excess enthusiasm for the new civic activity brought about destruction of the rink when the fire department attempted to improve the ice.

EDWARD VALENTINE, vice president, Fullerton Oil Co., left Los Angeles, Calif., this week to enter the Navy as a lieutenant commander but his destination, in accordance with regulations, will not be revealed.

GEORGE RANDALL, a member of the petroleum economics department of Standard Oil Co. of California, is back at his office in San Francisco, Calif., after an absence of several months spent in the hospital resulting from an automobile accident.

D. A. MOORE, of Wilshire Oil Co. and president of the Los Angeles Petroleum Accountants Society, appointed R. G. SNODGRASS, of Superior Oil Co., as chairman for the February meeting and the latter in turn secured the services of L. D. PRITCHARD, who discussed conditions in South America.

PAUL E. RUEDEMANN, manager of the Hungarian subsidiary of Standard Oil Co. of New Jersey, and a former resident of Tulsa and Bartlesville, Okla., is reported to be en route to America. It is reported that he has succeeded in joining a party of American diplomats who had been ejected from European countries which have come under the domination of Germany.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Producers Oil Co. completes 250-bbl. well at 2,240 ft. to open new and deeper sand for the Glenn Pool field, Creek County, Oklahoma, starting an extensive drilling play.

Roxana Petroleum Co. closes negotiations in St. Louis, Mo., for a site and materials for one of the largest refineries in the world to be built in the East Carondolet area (Wood River). A pipe line will be laid from old Oklahoma fields, where the company has extensive holdings, to St. Louis, to supply the refinery.

Mid-Continent Petroleum Corp. completes plans for the erection of a 12-story office building in Tulsa.

Royal Dutch-Shell interests in London, England, acquire control of extensive properties of Tampico-Panuco Oil Fields, Inc., Chijoles Oil, Ltd., and other companies in Mexico.

20 YEARS AGO

Production of all Mid-Continent and Gulf Coast fields passes 1,000,000-bbl. mark for first time. Mexia, Haynesville, Burbank, Bristow and Lyons fields largely responsible for the excess.

American oil men disconcerted over the large number of big wells being completed in Mexico and the rising production of that country.

10 YEARS AGO

Three-judge federal court hands down decision in Constantin and Wrather case involving martial law in East Texas. At first interpreted erroneously to mean the end of production control, the decision assured its continuance.

New well completed by Texas-Imperial at 4,550 ft. on Lethbridge structure, southern Alberta, Canada, indicates field of large magnitude.

Joseph Earl Stock, prominent independent oil man and active in development of Casper and Salt Creek fields, Wyoming, and in Arkansas and Louisiana, died at his home in Shreveport.

MARTIN E. HOOTEN, outside requirement man, Continental Oil Co., Ponca City, Okla., has been transferred to Houston, Tex., as title man for the land department.

W. I. FOX, engineer in the evaluation department of the Texas Co., Tulsa, has been moved to Garnet, Kans., to work on secondary-recovery operations.

T. J. DONOGHUE, retired vice president, Texas Co., Houston, Tex., has been chosen general chairman of the Houston Round-Table of the National Conference of Christians and Jews.

W. L. JAMES, purchasing agent, Stanolind Oil & Gas Co., Tulsa, has been appointed assistant director of purchases in charge of commodity procurement specialists of the War Production Board.

WIRT FRANKLIN, director in charge, Office of Petroleum Coordinator, District 2, Chicago, will be the principal speaker at a dinner meeting of the Illinois basin chapter, American Petroleum Institute, on March 5.

JAMES F. TOWERS has been elected president of Ford, Bacon & Davis, Inc., Engineers, of New York City. He succeeds WILLIAM von PHUL, who will actively continue as chairman of the executive committee, after having served as president for the past 20 years.

C. C. HEMSELL, geologist, Columbia Fuel Corp., was the principal speaker at the monthly meeting of the Panhandle Geological Society at Amarillo, Tex., last week. His subject was "The Lower Paleozoic Sediments of Cimarron County, Oklahoma, and Adjacent Area."

ROBERT GROSJEAN, formerly a geologist with Magnolia Petroleum Co., in Southwest Texas, is now associated with Brown & Wheeler, Inc., at Houston, Tex.

SHERMAN LANDIS, deputy inspector, Division of Oil and Gas Conservation, State of Illinois, Olney Ill., has been recalled to army service.

JAMES ANDERSON, vice president and treasurer of Humble Oil & Refining Co., Houston, Tex., has been elected president of the Houston Community Chest and Council.

ANTUM E. CUTHRELL, chief petroleum engineer for Standard Oil Co. of Argentina, presented a paper on "Operating Problems in Argentina" at the weekly meeting of the Houston Geological Society last week.

WILLIAM A. GOFORTH has been reelected president of the Valley Osage Oil Co., Tulsa, for the seventeenth consecutive time. N. T. GILBERT and A. T. GILBERT were reelected vice presidents, and C. A. SOLT, secretary-treasurer.

FRANK O. STIVERS, engineer, Plantation Pipe Line Co., is recovering in Tulsa from injuries suffered when he was struck by an automobile near the company's construction operations in Georgia. He is the son of FRANK A. STIVERS, vice president and manager, Texas-Empire Pipe Line Co.

PAUL H. PRICE, state geologist of West Virginia, has been elected president of the Association of American State Geologists. EARL K. NIXON, director, state Department of Geology and Mineral Industries of Oregon, was named vice president, and ROBERT H. DOTT, director, Oklahoma Geological Survey, was made secretary-editor. The election took place at the annual meeting of the association in Washington, D. C., February 13-14.

Rises Another Rung

When the Office of Petroleum Coordinator in Washington, D. C., obtained the services of Robert E. Allen when he became director of its Production Division last June, it acquired the benefit of 25 years' experience in and with the oil industry. That his services have been valuable is attested by his recent elevation to the post of assistant deputy coordinator.

ROBERT E. ALLEN

Petroleum has been Mr. Allen's business since 1916, when he went to work as a tool dresser and roustabout in the fields of West Virginia. In the more than a quarter century since then he has become recognized as an authority of international repute on the subject of petroleum, and, particularly, on its efficient production and utilization.

Conservation administration has occupied most of the time of the assistant deputy coordinator for the past 13 years. His activities have included such assignments as assistant oil umpire of California; executive secretary of the central conservation committee of California oil production, and chairman of the Petroleum Conservation Board of Alberta. He came to the OPC from the last-named position.

Mr. Allen is a graduate of University of West Virginia. Beginning his oil-field work while still in school, his experience has since included work in Texas, Mexico, California, Australia, and Canada. In California he attained a supervisory position with Continental Oil Co., which he left in 1929 to become identified with the then developing movement for the conservation of oil and gas resources. In 1930 he served on the Petroleum Economics Committee, and in 1935 he was a member of the Small Enterprises Committee, of the federal Government.

ROBERT G. CARR, oil man and president of the San Angelo (Tex.) Board of City Development, has been commissioned a major in the U. S. Army.

PHIL DAVISS, scout for Tide Water Associated Oil Co., in the Wichita Falls, Tex., district, has been transferred to Oklahoma City, Okla., and will work with FLOYD NEWLIN, land man and head of the division office.

FRED P. SHAYES, geologist of Union Oil Co., at Beeville, Tex., will present a paper on the "Geology of the Agua Dulce and Stratton Fields in Western Nueces County" to the South Texas Geological Society at Corpus Christi, Tex., February 27.

DONALD R. KNOWLTON, director of production in the Office of Petroleum Coordinator, Washington, D. C., on leave of absence as general production manager of Phillips Petroleum Co., Bartlesville, Okla., will address the spring meeting of the southwestern district, American Petroleum Institute, on February 27, at Dallas, Tex.

J. W. HOUSE, Midland, Tex., has been appointed chairman of the Midland County committee for the collection of scrap metal and rubber for the Texas petroleum industry. The appointment was made by CHARLES F. ROESER, Fort Worth, Tex., general chairman of the oil and gas industry's collecting campaign.

D. G. GRAY, executive vice president of the North Texas Oil and Gas Association, has accepted the post of director of marketing for District 3, Office of Petroleum Coordinator. Mr. Gray assumed his duties last Tuesday with headquarters at Houston, Tex. He has been in the oil business in North and West Texas since 1915, and has held his present position since 1938.

HERMAN LAYER, California independent operator, is convalescing after having spent 7 weeks in the hospital due to having suffered a broken shoulder and leg when hit by an automobile New Year's Eve.

Shifts: CRAIG FERRIS, geologist, Mott-Smith Corp., Tallulah, La., to Mendenhall, Miss.; J. E. WHEATLEY, superintendent, Humble Oil & Refining Co., Kemah, Tex., to Dickinson, Tex.; W. J. JONES, Pugh & Hickman Drilling Co., Hope, Ark., to superintendent, Benedum-Trees Oil Co., Shreveport, La.; F. B. LOOMIS, JR., geologist, Shell Oil Co., Inc., Magnolia, Ark., to Kosciusko, Miss.; W. T. HUGHES, superintendent, Lee Drilling Co., Vandalia, Ill., to Hope, Ark.; H. G. PICKLESIMER, geologist, Arkansas Fuel Oil Co., Alba, La., to Hope, Ark.; C. L. WHITEMAN, engineer, Texas Co., Parkersburg, W. Va., to Carbondale, Ill.; GERALD B. MADDOX, geologist, Carter Oil Co., Ponca City, Okla., to Magnolia, Ark.; R. L. RANKIN, engineer, Shell Oil Co., Inc., Tulsa, to Wichita Falls, Tex.; ELLIS CUTTER, Imperial Core Drilling Co., Clarendon, Tex., to Vicksburg, Miss.; B. S. WEAVER, engineer, Phillips Petroleum Co., Odessa, Tex., to Bartlesville, Okla.; V. R. LAY, Sultana Drilling Co., Inc., Logansport, La., to Jena, La.

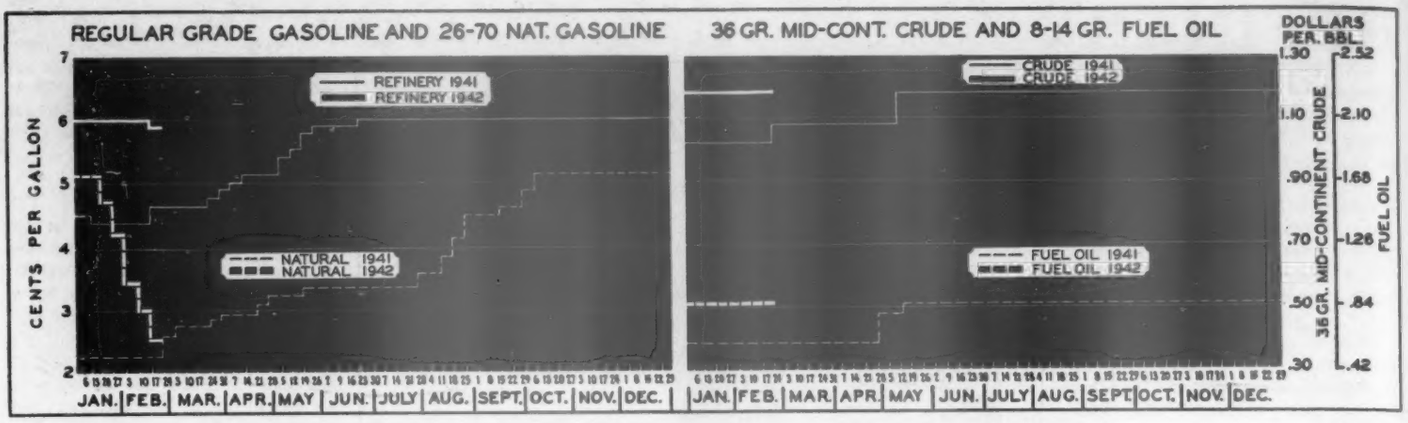
MILLARD T. KIRK has retired after 40 years of service in the oil and gas industry, 22 of these years having been with Phillips Petroleum Co. He was in the natural-gas and natural-gasoline department when he reached the retirement point. He and Mrs. Kirk are moving from Bartlesville to Norman, Okla., where their children are attending the university.

A. F. RICHARD was elected president; J. W. GARRETT, vice president, and R. K. PEARSON, secretary-treasurer, of the Big Indian Oil & Development Co., Kansas City, Kans., at a meeting of directors. HUGH B. WUNRATH, Omaha, Neb., was elected a member of the board of directors to succeed WALTER G. FLETT, resigned. In addition to officers, other directors reelected were R. F. HICKOK, W. C. HURST, HAYDEN KEMPER, W. P. KREEGER and G. E. McDONALD.

EDDIE REID, superintendent of Arrow Drilling Co., has been transferred from Carmi, Ill., to Shawnee, Okla.

L. L. GAMBLE, Daugherty Refining Co., Petrolia, Pa., was elected president; E. E. BRUMBERG, Quaker State Refining Co., Oil City, vice president; E. A. BARROR, Valvoline Oil Co., Butler, secretary, and GEORGE W. EBERT, James B. Berry Sons Co., Oil City, treasurer, of the Western Pennsylvania Refiners Traffic Association, at its annual meeting last week.

WILLARD F. JONES, general manager, marine department, Gulf Oil Corp.; CHARLES KURZ, president, Pennsylvania Shipping Co., and THOMAS E. BUCHANAN, general manager, marine department, Texas Co., were elected to the board of managers of the American Bureau of Shipping, at the eightieth annual meeting of the bureau. At the same time, A. L. QUACKENBOSS, supervisor of marine operations, Union Oil Co., Los Angeles, Calif., was elected a member of the bureau.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK, Feb. 24. — Restriction of residual fuel-oil deliveries to maintain not greater than 2 weeks' supply in consumers' tanks is expected to account for a saving of 3,000,000 bbl. between now and April 1 and the step is expected to temper the critical situation that now prevails in the East. However, it provides no remedy for distributors whose supplies are running low and who have no means of relieving their shortage.

These distributors are dependent on tanker shipments from the gulf and the delay resulting from tanker losses has reduced their supplies to dangerously low levels. Attempts on the part of some of them to replace tanker shipments with rail shipments have been defeated by their inability to obtain tank cars.

East Coast stocks have been on the decline since the end of November. In the 11-week period to February 14 they dropped from 82,034,000 bbl. to 59,627,000 bbl. of crude oil and refined products. The decline of 22,407,000 bbl. was an average of 2,000,000 bbl. a week and was equivalent to more than 27 per cent of the stocks held on the East Coast November 29.

Gasoline stocks have been well maintained in this period but none of the normally necessary additions have been made and the beginning of the motoring season will find East Coast gasoline inventories at an unsatisfactory level. The decline has been centered on fuel-oil stocks now experiencing their heaviest demand but with the end of the heating-oil season only a little more than a month away, it is believed that the currently low light fuel-oil stocks will be sufficient to enable the industry to finish the season.

Metropolitan New York gasoline dealers have asked the city to enact an ordinance making it illegal to sell gasoline between 7 p.m. and 7 a.m. as part of a five-point program to conserve supplies. Other points were: Easing of parking restrictions, a moratorium on service-station mort gages, strict enforcement of the price-posting law, and representation of gasoline dealers and garage owners on conservation committees.

Evidence that wax schedules are not being adhered to was contained in the warning from the OPA that exporters should not buy from jobbers or producers at prices above the schedule. Reports have been received that producers and jobbers had been offering wax to the exporters at quotations allowed under the higher ceiling applicable to sales to buyers outside the continental United States.

Mid-Continent

Reductions in prices of both refinery and natural-gasoline prices were recorded in Mid-Continent markets the past week. Refinery gasolines this week were offered from 0.125 to 0.250 cent per gallon under prevailing quotations of a week ago. Naturals dropped off another 0.50 to 0.75 cent per gallon.

Prospects early last week that refinery gasolines might stiffen following circulation of a number of inquiries for material for tank-car shipment to the East Coast faded, and the market continues slow with the effect of tire rationing on consumption becoming felt more and more.

Additional sharp drops in natural gasolines are adding to the acuteness of this market and the pressure on the sellers. Prices of natural gasolines have declined more than 2.50 cents since the first of the month, and still no indication is given of any turn in the situation with demand almost completely stagnant.

SENTENCE SUMMARIES

MID-CONTINENT: Refinery gasoline slip. Naturals continue sharp decline.

EAST COAST: Supplies reduced to dangerously low levels. Demand heavy on fuel oils.

GULF COAST: Gasoline prices shaded for prompt lifting. Pick up in fuel oils demand slower than expected.

PACIFIC COAST: Prices steady. Movement grows.

PENNSYLVANIA: General market unchanged. Prices firm.

A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

(Week ended February 14, 1942)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
East Coast	513	19,317	8,586	10,328
Appalachian	147	3,814	574	373
Ind., Ill., Ky.	720	21,699	4,250	3,653
Okla., Kans., Mo.	347	9,857	2,101	1,067
Inland Texas	179	3,575	1,204	125
Texas Gulf	1,020	18,677	9,204	7,817
Louisiana Gulf	158	4,727	2,174	1,428
No. La. and Ark.	85	980	331	89
Rockies	87	2,257	618	277
California	516	16,893	60,913	12,355
Total Feb. 14, 1942	3,772	101,796	89,955	37,512
Total Feb. 7, 1942	3,853	100,224	90,859	40,038
Total Feb. 15, 1941	3,606	93,801	97,479	36,482

Note: Total refinery runs and product stocks for week ended February 21, 1942, appear on Trends page.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
February 14, 1942	254,463,000
February 7, 1942	252,366,000
February 15, 1941	260,948,000

*Excludes heavy, unrefinable crude in California.

However, the fact that the present price offerings are below crude-oil prices, and about as cheap as manufacturers can possibly afford to sell the product, the prices actually being below cost, there is a possibility that prices might tend to level off. It is pointed out that if these low prices won't sell the product, no prices will, which situation might serve as stabilizer.

With these low prices, sellers are attempting to develop some crude pipe-line business calling for the commingling of natural gasolines with crude oil in pipe-line shipments to the middle western and eastern states. Several propositions are now pending, which if successful might bring about a change in the outlook.

Kerosenes are being maintained fairly well, although there is some shading of prices on material not meeting quality specifications. The colder weather throughout the northern and middle western states is incentive for hopes for some increase in demand for heating oils, gas oils, and other fuels. However, with movement to the eastern states still handicapped, chance of substantial increase is limited.

What demand trend there is for fuels is generally toward the heavier fuels at the expense of the lighter fuels.

Gulf Coast

HOUSTON, Tex., Feb. 24.—Gasoline stocks on the Gulf Coast are reported to be 6,200,000 bbl. higher than they were a year ago, and with all available tankers now being converted into fuel-oil service it is generally believed that further increases in gasoline stocks are in prospect. Major refiners are said to be especially overstocked with gasolines. Independents reduced their stocks considerably by large-scale lend-lease buying at the close of 1941. A large portion of this material sold by large refiners to the British Government is still being held in storage awaiting tankers. Tank-car movement is said to have been increased, averaging around 65,000 to 70,000 bbl. daily, and there is little indication that movement from the gulf will go much higher because considerable material is available at points closer to the East Coast.

Unleaded 68-70 gasoline was quoted at 5.875 cents, a decrease of 0.375 cent from previous quotations. However, this quotation was made subject to prompt lifting, and sale of the material was not confirmed. Sellers are said to be offering this concession because of weakness in the 26-70 grade of natural gasoline.

Conversion of all possible tankers to fuel-oil service to bolster declining stocks on the East Coast as ordered by OPC, has been slow and the anticipated strengthening of the fuel-oil market failed to materialize this week. No. 2 fuel was still quoted at 3.875 cents.

REFINERY AND TANK-WAGON PRICES

(Prices as of February 24)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*				5.875-6.000		5.500-5.750	5.125-5.375
Pennsylvania			6.750-7.000				
Gulf Coast‡	6.00-6.50			§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast				8.300	8.300		
Pacific Coast		7.000-7.500	6.750-6.875	6.500-6.750	6.250-6.500	6.000-6.500	5.000-5.750

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.250	2.625-2.750	
North Texas	2.000	2.375-2.500	
North Louisiana	2.125	2.500-2.625	
California			4.750-5.000

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*			4.500	4.375-4.625	
North Louisiana			4.375		
Pennsylvania	6.250	6.125-6.250			
California				4.500-6.000	4.500
Northeast Coast				5.300	
Gulf Coast				3.875	

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125					
California		2.750-4.000			‡$1.35-1.45	$0.85-0.90
Gulf Coast			4.000	4.125	1.45	0.85
Northeast Coast				5.200	2.15	1.35
North Louisiana						†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	
Northeast Coast	5.2	5.2	1.65-75	1.35
Pacific Coast	5.5	5.5	†0.85-95	†0.80
Gulf Coast	3.875-4.0		1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3½	19.50
600-3½	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		38.50
Zero pour point		37.50
10 pour point		36.50
15 pour point		31.00
25 pour point		
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		6.250
133-135 (A.m.p.) wax		6.550
Crude scale:		
124-126 (A.m.p) w.s.		4.350-4.455
124-126 (A.m.p.) y.s.		4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast		6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene 41-43	Diesel fuel 24 G.	48-52 D.I.	58 D.I.	Bunkers	Bunker C grade
Gulf Coast	4.000-4.250		4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30			†1.35-45	*0.85-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils 200-3	Neutral oils 150-3	Bright and cylinder stocks 200-3	Bright and cylinder stocks 150-3	Bright and cylinder stocks 600&630 S.R.
Mid-Continent	16.8		28.8	24.8	
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero tank wag.
Baltimore, Md.	15.05	5.50	8.70
Boston, Mass.	14.00	4.50	8.00
Burlington, Vt.	16.00	5.50	
Buffalo, N. Y.	15.30	5.50	8.30
Dover, Del.	15.80	5.50	10.50
Hartford, Conn.	14.70	4.50	
Manchester, N. H.	16.40	5.50	9.00
Newark, N. J.	14.30	4.50	7.90
New York, N. Y.	15.20	5.50	8.00
Philadelphia, Pa.	15.30	5.50	10.15
Pittsburgh, Pa.	15.80	5.50	10.50
Portland, Me.	15.40	5.50	8.10
Providence, R. I.	14.10	4.50	7.80
Washington, D. C.	14.30	3.50	9.20
Average 14 cities	15.04	5.07	8.72

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.25	8.00	8.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	15.00	7.00	8.00
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	14.90	5.57	9.44

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero tank wag.
Atlanta, Ga.	18.50	7.50	10.00
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.05	7.50	
Charleston, W. Va.	18.35	6.50	11.50
Charlotte, N. C.	19.20	7.50	9.50
Jacksonville, Fla.	18.50	8.50	8.00
Jackson, Miss.	18.00	7.50	9.00
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.75	8.50	†10.50
Norfolk, Va.	16.55	6.50	10.20
Average 11 cities	18.05	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.17	12.83
Average 50 cities	16.14	5.96	9.87
Average last week	16.03	5.96	9.80

Crude-Oil Prices

Effective February 19, Arkansas Fuel Oil Co. posted prices for the new Pettit lime production of the Haynesville field, Claiborne Parish, Louisiana. The schedule ranges from 88 cents for oil of 25 gravity and below, with 2 cents per degree of gravity, up to $1.20 for 40 gravity and above.

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	2.75

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas, Lea County, N.M.
18-18.9	$0.80			
19-19.9	.84		$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9		1.07	1.30	.94
32-32.9		1.09	1.32	.96
33-33.9		1.11	1.34	.98
34-34.9		1.13	1.36	1.00
35-35.9		1.15	1.38	1.02
36-36.9		1.17	1.40	1.04
37-37.9		1.19	1.42	1.06
38-38.9		1.21	1.44	1.08
39-39.9		1.23	1.46	1.10
40 and above		1.25	1.48	1.12

Michigan Fields

(Continued from Page 111)

Kent County, Walker Township: Wolverine Natural Gas Corp. 1-B Johnson et al, NE NW NW 4-6n-12w. location abandoned.

Osceola County, Lincoln Township: Ohio Oil Co. 2 Vincent, N½ NW NE 6-18n-10w, 360 bbl., acidized, T.D. 3,605 ft.

Pure Oil Co. 2 Richard, N½ NE S'' 19-18n-10w, 6,984 bbl., T.D. 3,595 ft.

Ohio Oil Co. 2 Leusby, S½ NE SW 20-18n-10w, 8,160 bbl., T.D. 3,556 ft.

Ohio Oil Co. 4 Gingrich, S½ SW NW 31-18n-10w, flow by heads, 64 bbl. first 17 hr., T.D. 3,627 ft.

Ohio Oil Co. 1 Homan, S½ NW SW 32-18n-10w, 3,864 bbl., T.D. 3,563 ft.

Roscommon County, Roscommon Township: Eugene Hilliard 3-A State, N½ SW SE 34-21n-3w, 2,160 bbl. est., T.D. 3,445 ft.

Van Buren County, Bloomingdale Township: Michigan Devonian Petroleum Co. 1 Harbolt, NW SW SW 15-1s-14w, wildcat, dry, T.D. 1,292 ft.

LEGAL

OIL AND GAS LEASE

United States Department of Agriculture, Forest Service, Muskegon, Michigan, January 30, 1942. Sealed bids in triplicate will be received until 10:00 A.M. Eastern Standard Time, March 9, 1942, and then publicly opened, offering bonus for operating rights in connection with gas and oil leases on land located in the State of Michigan, Oceana County, Greenwood Township, T 13 N, R 15 West, Michigan Meridian. Section 30: S½ NW; NW SW. Award of lease will be made only to bidder who can show sufficient experience and financial resources and prove citizenship. Interested parties may obtain bid documents, lease forms and operating regulations from the Forest Supervisor, Forest Service, Muskegon, Michigan.

When it comes to the valve stem in the Christmas tree... you can't beat Chrome-Moly 4140

Any job as important around an oil well as that of the Christmas tree valve puts materials right on the spot. You can't safely design for capacities up to 5000 p.s.i. with anything but the best in every part.

Hence the increasing use of Chromium-Molybdenum (4140) steel for Christmas tree valve stems.

With the proper heat treatment (details on request), the steel develops a tensile strength of 150,000 p.s.i., ample to withstand closing the valve under pressure. A hardness of about 290 B.H.N. prevents untimely and uneven thread wear.

The steel's machineability in the heat treated condition, together with its comparatively low cost, promotes manufacturing economy.

Write for our free technical book, "Molybdenum in Oil Production".

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
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Climax Molybdenum Company
500 Fifth Avenue, New York City

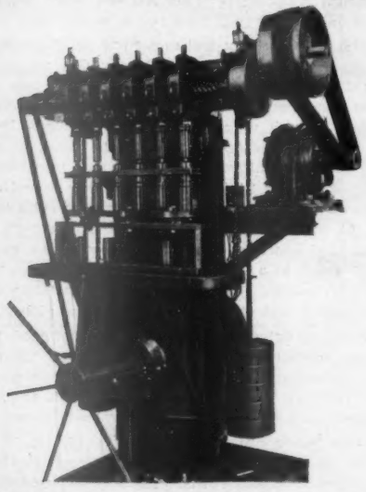
MOLY

EQUIPMENT PROGRESS...

Machine Assures Shoulder Contact For Sucker-Rod Couplings

The new automatic coupling lapping machine, recently introduced by the D + B Division of the Emsco Derrick & Equipment Co., Los Angeles, Calif., is designed to impart a greater degree of accuracy to the faces of D + B sucker-rod couplings.

This new lapping process is an additional operation and does not replace any of the former steps for trueing coupling faces. The coupling faces are precision ground, as before, but are extra processed in the lapping machine. This finishes them with the high degree of accuracy so necessary for the economical and efficient operation of the rod string.



Lapping assures perfect smoothness on the coupling faces. Uniform contact between the coupling faces and the shoulder of the sucker-rod pins makes a more positive joint and better alignment of the entire rod string. Pin failures due to eccentric loading are eliminated and a friction-locking effect reduces the possibility of unscrewing.

New Applications Sought for Votator Heat Transfer Units

Wider markets are being sought by the Votator Division of the Girdler Corp., Louisville, Ky., for a highly efficient, continuous, closed type of heat transfer mechanism for liquids and viscous materials.

The unit, known as the Votator, has been employed heretofore as an integral part of complete processing equipment manufactured by this company for a special group of industries.

The unique basic features of the Votator are continuous operation under pressure in a closed system, and extremely rapid rate of heat transfer. The latter feature results from the high ratio of heat transfer surface to volume of material.

With only a thin wall separating the product from the heat-transfer medium, the rate of heat transfer is extremely fast. The action of the revolving scraper blades quickly removes the film from the wall, thus continuously exposing the heat-transfer surface to the incoming product.

The process makes it possible to get extremely high K-value, uniform temperature throughout the product, and accurate temperature control. The high ratio of surface to volume permits change in temperature of the product through a wide range in the shortest possible time, usually a matter of a few seconds. The heat transfer is so rapid that many products can be supercooled well below the crystallization point and discharged from the Votator in a liquid state. The scraping and mixing action of the blades assures uniform temperature change in the product as it progresses through the annular space between the mutator shaft and the heat-transfer tube.

Products may be heated or cooled without contacting the atmosphere, due to the fully enclosed design of the unit. Conversely, predetermined amounts of gas may be incorporated into the product. The unit also can be used to make a uniform mixture or to emulsify a mixture of products while the temperature is being changed.

Low-temperature refrigerants or high-temperature steam can be used for the heat-transfer medium. The metal jacket surrounding the heat-transfer medium is heavily insulated, and the entire tube assembly is protected by a substantial metal cover.

The arrangement of the connections for the product and for the medium permits varied piping hook ups, so that the mechanism can be incorporated into virtually any flow system.

Multiple assemblies may be used for both heating and cooling the product in a few seconds. The company is prepared to produce the mechanism in standard sizes and designs to fit the needs of many processes that warrant production on a quantity basis, as well as to meet certain requirements that may call for individually engineered units.

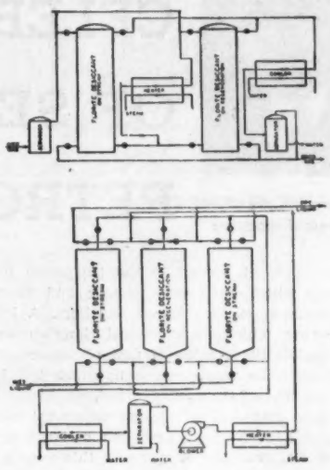
Portable Searchlight Unit Built by Lister-Blackstone

Lister-Blackstone, Inc., Milwaukee, Wis., has started manufacturing a new portable searchlight unit in addition to its regular floodlight machines. Called the "Nite-Hawk," the new unit is a fully, self-contained source of light. It has a 24-in. searchlight with 3,500,000 candlepower, and throws an effective beam of light a mile. Two 30,000-candlepower, wide-angle floodlights also are mounted for use as auxiliary or general lighting. If desired, more powerful searchlights, with candlepower up to 9,500,000 and effective lighting ranges up to 3 miles, may be used.

The unit is mounted on a two-wheel sprung frame on wheels with pneumatic tries, and can be towed easily by automobile or truck. A third retractable wheel allows the unit to be wheeled into position. Power is supplied by an air-cooled, 14-hp., Le Roi engine, equipped with an electric starter. A 5,000-watt, self-regulating d.c. generator, connected to the engine, delivers direct current at 110 to 120 volts, the voltage being controlled by a rheostat on the panel board.

Floridin Co. Announces New Drying Agent

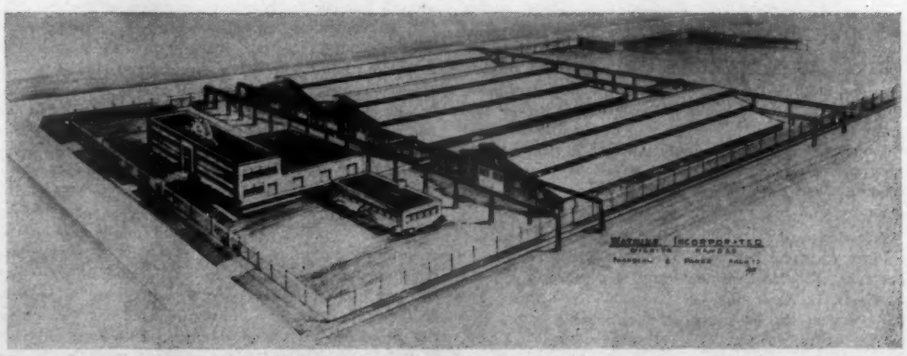
Florite Desiccant, a new granular drying agent for gases and liquids, has recently been placed on the market by the Floridin Co., 178 Liberty Street, Warren, Pa. Florite Desiccant, satisfactory in a variety of industrial processes requiring bone-dry gases and liquids, has also proved economical in many installations where high drying efficiency is not ordinarily demanded. Among the products now being successfully dehydrated are natural gas, propane, gasoline, air, nitrogen, and carbon dioxide. It may also be used in breathers for storage tanks and electrical transformers, to dehumidify air in air-conditioning systems and to dehydrate refrigerants.



Top: Dehydration plant for gases. Bottom: Dehydration plant for liquids

The outstanding characteristic of Florite Desiccant is its ability to maintain a high drying efficiency under conditions that have rendered competitive materials useless. It adsorbs water instantly and will not swell, disintegrate, or appear wet at the end of an adsorption cycle. It is hard, stable, noncorrosive, and nonpoisonous. Florite Desiccant selectively adsorbs 4 to 20 per cent of its weight in water, depending on the particular application, and is regenerated by heating to 300°-350° F.

NEW STEEL FABRICATION PLANT BEING CONSTRUCTED BY WATKINS



Watkins, Inc., of Wichita, Kans., is constructing a new plant for steel fabrication and plate work. It will be modern throughout, employing line production methods, and will cost approximately $250,000. Although for the present, facilities will be devoted largely to war efforts, the plant was designed for conversion to serve the petroleum industry when conditions permit.

Los Angeles plant and general offices of Axelson Manufacturing Co.

J. C. Axelson, president and general manager

AXELSON MFG. CO. CELEBRATES 50 YEARS OF SERVICE TO THE PETROLEUM INDUSTRY

FIFTY years of service to the petroleum industry! Years which have seen greater and greater demands heaped on the oil-well suppliers. A half century during which technological improvement has made possible the tapping of new oil sources, the operating of wells more efficiently, and the keeping abreast of skyrocketing oil demand.

That's the story behind the announcement made this month by J. C. Axelson, president of Axelson Manufacturing Co., that the company is this year celebrating its golden anniversary.

As pioneers of a number of design improvements in pumps, sucker rods, and other requisites of the petroleum industry, the company possesses a most interesting history. In 1892, on an original capital investment of $1,200 scrimped from wages, a small iron works in the then country town of Santa Ana, Calif., was purchased by two Axelson brothers, C. F. Axelson, a machinist, and G. A. Axelson, a molder. Even to these young middle westerners, whose later accomplishments proved their vision, this could hardly have seemed the beginning of a firm which today enjoys a 6-million-dollar annual sales volume. Behind the story of the company's successful operation lies an idea possessed by the two brothers from the time they were 10 years of age. Both had made up their minds that they were going to have a manufacturing plant, complete with machine shop and foundry and their every move from that point on was made towards this predetermined objective. Their determination and selection of a goal is in striking contrast to the youth of today, many of whom go through high school and college before they decide what they want to do.

Today the sons of these founders, carrying along the unique research methods and production standards, are operating a company whose scope of oil-field service is literally described in their paraphrased slogan: "The sun never sets on Axelson pumps and sucker rods." And in 1942 the company's foundries, machine shops, and assembly lines are supplying American war industry—for the second time—with essential production and maintenance equipment. Developed during the first World War, Axelson's well-established line of machine tools, heavy-duty lathes, and accessories is under "all-out" production to supply America's 1942 victory program. Pumps, sucker rods, gages, and numerous other oil-field supplies are essential to our "Keep 'Em Pumping" oil program.

Simultaneously, the company this year will produce a large volume of aviation parts for Allied warplanes, according to Vice President (and also "second generation") D. F. Axelson.

Reviewing the 50 years of development which the above production activities reflect, President Axelson describes the original brothers as "anything but lazy." Just how conservative "J. C." is putting it may possibly be shown presently.

Santa Ana townspeople in the early nineties soon learned that "the Axelson boys" were not without imagination and originality. The shops (then known as Acme Iron Works) early produced a new design of gang plow. Continuing their experiments in an expanded plant in Los Angeles after 1895, they produced an automobile engine whose only immediately evident handicap was a marked lameness in the ignition design. Undaunted by their one failure, the boys tackled and solved a wholly foreign problem of designing a press for printing tissue orange wraps in three colors.

Above, left: G. A. Axelson, one of the original founders. Above: E. E. Kerfoot, assistant general manager and treasurer. Left: D. F. Axelson, vice president

Their success in this and other assignments did not, however, sway the brothers from an early interest in oil-well pumps. Their initial contribution was the original Parker pump, first to employ the now standard metal-to-metal principle. By the turn of the century, petroleum engineers in the far western oil fields were already beginning to talk about the pump that could handle their high-sand-content, heavy-gravity oil. Long before the American Petroleum Institute introduced standards of oil-well-pump manufacture, the company established its famous policy of full interchangeability. Axelson pumps were the first to be made so accurate in all parts as to permit the interchangeability of plungers, liners, cages, etc., from one pump to the other. Likewise, the company was first to evolve and develop the theory that in production of gray-iron castings, uniformity and excellence lay in the control. As a result, laboratory and testing equipment checking the physical and chemical characteristics of all raw material going into Axelson castings came into being and have been steadily improved, year after year.

A few years later, engineers of the again-expanded company developed the "Parker-Improved" sucker rod, which marked the beginning of a succession of sucker-rod improvements by the company's research staff. In this department, as with pumps, the brothers had established uncompromising standards at the outset. Yet, so well conceived was this new sucker rod that constant experimentation could reveal no major improvements in design and manufacture until 1916, when the one-piece, fully upset sucker rod was introduced. Axelson was the first to fully treat, quench, and draw sucker rods and from this operation, at the time considered revolutionary, developed today's practice of fully normalized sucker rods from pin end to pin end. As an indication of how this department developed, the company's present-day plants in Los Angeles, Calif., and St. Louis, Mo., can produce better than 2,000,000 ft. of sucker rods per month.

Another offshoot of the diversified Axelson petroleum-industry services was born about the same time as was the "Parker-Improved" sucker rod. With a broader line there was justification for starting the first of their present chain of supply outlets that now serve the important fields of the Far West. These stores are now located at Bakersfield, Taft, Long Beach, Torrance, Huntington Beach, Santa Fe Springs, Orcutt, and Ventura, Calif. As their products increased and improved, their scope of operation extended beyond California and came to include not only the Mid-Continent and eastern oil fields of the United States, but those of Poland, Russia, Persia, Dutch East Indies, and South America. By 1925 Axelson interchangeable pumps and sucker rods were in use everywhere.

In the Mid-Continent and eastern areas, the company is represented by Frick-Reid Supply Co., as well as Great Northern Tool & Supply Co. These two well-known concerns together make Axelson products acceptable through over 75 field supply stores. Indicative of their progressive attitude, however, is their policy of maintaining their own selling organization, consisting of over 24 factory representatives and sales engineers who are in a position to give service wherever the products are sold. Before the present war cut off the exporting of production equipment to foreign oil fields to a major degree, representatives were located in London, Bucharest, Balik Papen, Maracaibo, Buenos Aires, and other points around the globe.

Perhaps applying the theory that "one good turn deserves another," lathes were produced by the company, beginning about a quarter century ago. The highly regarded heavy-duty Axelson lathe is today an important part of the company's product lineup.

Axelson lathes are manufactured in 14, 16, 18, 20, 25, and 32-in. sizes. Made of the finest materials throughout by skilled craftsmen, many of whom have been with the organization for 30 or more years. Axelson lathes are employed today in practically every branch of metal-working industry. They are used in handling not only the heaviest of roughing cuts, but in doing close precision work as well. As today's offense program hits its stride, Axelson lathes are being employed in the machining of parts for airplanes, guns, ships, munitions, tanks, and similar products.

The old adage about the world wearing a path to your door if you build a better mousetrap (or gage!) was proved years ago when other manufacturers started demanding to purchase the precision gages which Axelson engineers developed from time to time. These gages and specially designed precision machinery were all developed in the interests of absolute accuracy in the manufacture of interchangeable pump parts, including plungers, seats and balls, and other fittings. As the demand for gages became more and more persistent, a gage sales division was gradually developed. Axelson gages rank with the highest in regular tests of the Bureau of Standards.

Incorporated with a capital of $500,000 in 1919, the Axelson destinies were directed by a board consisting of the four Axelsons, of whom two were the founders, and two the present top executives already mentioned. In 1927, E. E. Kerfoot, assistant general manager and treasurer, was added to the board.

In reviewing the 50-year span of the company's existence, most oil-field men would vote as their most important contributions to the industry one or more of the following: development and improvement of the metal-to-metal pump principle, greatly increased pump efficiency and lifetime capacity; introduction of the improved sucker rod, overcoming many costly breaks in the well; the inauguration of completely interchangeable pump parts, permitting rapid repairs at the well; and the unceasing quest for absolute accuracy which has set the standard for the oil-well supply industry to follow.

Magcobar to Be Sold Through Company's Own Sales Force

Magnet Cove Barium Corp., Malvern, Ark., announces that hereafter its product will be known under the trade name of Magcobar and will be marketed through the company's own sales organization. For the past 1½ years this mud weight used in oil-well drilling has been sold through a sales agent under the name of Magnawhite. Approximately 1,000,000 bags of this material have been used by many of the major oil companies, and to meet the constantly increasing demand the plant has been enlarged twice, since starting operation June 3, 1940.

Partial view of the flotation process as the barite has agglomerated and floated to the top of the large cells from where it passes to final processing

Loading crude rock at the open pit for Magcobar. The rock is screened and crushed, and then hauled to the main plant at Malvern, Ark., for final processing

Sales offices have been opened in the Niels Esperson Building, Houston, Tex., with Willard Johnson, president, in charge of all sales activities. Mr. Johnson also is vice president of the Wolf River Corp., which controls the largest barite mine east of the Mississippi. The company offers the services of experienced mud engineers who will be available for consultation on weighting material problems. Large stocks of Magcobar are maintained at the Malvern plant and in warehouses throughout the Mid-Continent and the Gulf Coast.

Company activities at Malvern are under the guidance of H. B. Brown, vice president, and L. Roth Harrison, general manager. Mr. Harrison, a metallurgist and engineer, developed Magcobar, adapting the flotation process, well-known to the mineral industry for concentrating a wide variety of minerals. This is the first recorded case, however, of flotation of a nonmetallic mineral ground so fine.

Magcobar weighting material is an inert material high in $BaSO_4$ content. Not adulterated by any chemical, clay, or bentonite additions, the finished product represents a concentration of this $BaSO_4$ occuring in the crude rock.

The crude rock is mined at Magnet Cove, Ark., a short distance from the company's plant at Malvern. The ore deposit consists of a giant syncline with outcrops ⅛ mile apart. The bed varies from 15 to 60 ft. in width and consists of many small beds of barite rock, sandstone and various colored clays. It has been estimated that the ore deposit contains sufficient barite to last 100 years at the present rate of mining.

Complete description of the processing of Magcobar, charts illustrating viscosity comparisons, gel strength comparisons, wall building and filtration relationships and resistance to gas cutting, together with summary mud data, are covered in a technical publication, "Controlled Weighting Material," which may be obtained by writing the Magnet Cove Barium Corp., either at Malvern or from the Houston, Tex., sales office.

TRADE LITERATURE

JONES & LAUGHLIN STEEL CORP., Gilmore Wire Rope Division, Pittsburgh, Pa.—Rotary Line Service Record booklet prepared for the convenience of oil drillers and contractors in keeping a service record on the wire rope they use. It contains two charts, one for finding wire line service in ton miles for round trips with drill pipe, and the other for finding wire line service in ton miles for half round trips with casing and tubing.

JOHNS-MANVILLE CORP., 22 East Fortieth Street, New York, N. Y.—Industrial Products Catalog for 1942, Form GI-6A. This is a 52-page, illustrated book containing information and recommendations on high and low-temperature insulations for every industrial need from 400° F. below zero to 2,500° F. above zero. It also contains complete data on refractory and other products of this company.

EHRET MAGNESIA MANUFACTURING CO., Valley Forge, Pa.—Heat insulation handbook. Included in this 176-page ready-reference volume is a comprehensive Insulation Recommendation Section, illustrated with 91 drawings and photographs of application details. The Useful Data Section contains 24 pages of engineering tables, graphs, and definitions of technical terms.

CHAIN BELT CO., Milwaukee, Wis.—Catalog Bulletin 400 illustrating and describing the line of Rex centrifugal water pumps for 1942. Included is not only detailed information and specifications concerning the design and manufacture of these pumps, but also valuable data on how to pick a pump for a specific job. Rex Speed-Prime pumps are made in capacities ranging from 3,000 gal. per hour, to 125,000 gal. per hour.

THE GIRDLER CORP., Votator Division, Louisville, Ky.—A booklet announcement describing the Votator method of heat transfer for liquids and viscous materials.

CATERPILLAR TRACTOR CO., Peoria, Ill.—Eight-page booklet entitled "Caterpillar Power for Pipe-Line Pumping," Form 7279. It is freely illustrated with action pictures of various diesel-engine installations on pipe lines with data on application.

Patterson-Ballagh Adds Safety Latch to Mud Gun

Patterson-Ballagh Corp. has added a safety latch to its mud gun and has streamlined the flow of mud through the gun to eliminate an abrupt curve. The improved gun has a long swing ell and its main casting is of heavy steel. A locking ring provides for verticle adjustment. The new spring latch permits horizontal locking without the necessity of unbolting. The gun can be equipped with an extended pipe and a rubber nozzle.

AMONG EQUIPMENT MEN

Price Elected President of Industrial Engineering Co.

Harold C. Price, president of H. C. Price Co., pipeline welding and contracting company, Bartlesville, Okla., has been elected president of Industrial Engineering Co., manufacturer of Somastic pipe coating, in connection with changes being made in the administrative organization of the latter company.

W. W. Colley, Houston, Tex., who has been associated with the company for many years both in Texas and California, has been made vice president and general manager. K. H. Dyer, Wilmington, Calif., associated with the company since its early days, has been made Pacific Coast manager.

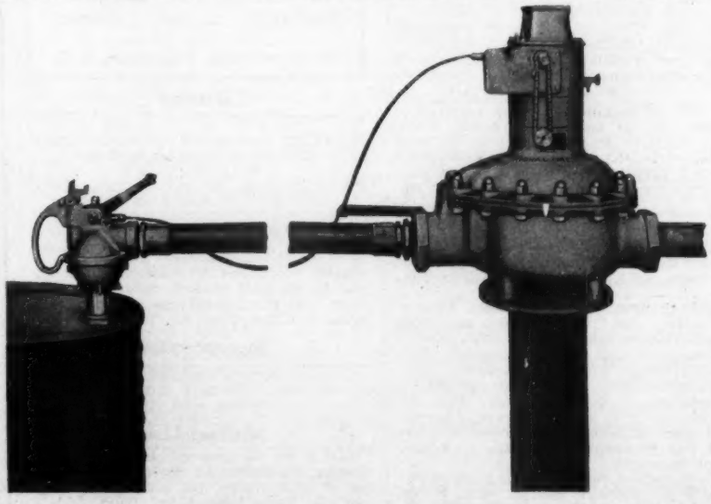
Other officers are S. D. Bechtel and K. K. Bechtel, San Francisco, Calif., chairman of the board, and vice president and treasurer, respectively; W. E. Waste, Los Angeles, Calif., secretary, and Henry J. Kaiser and G. G. Sherwood, Oakland, Calif., additional directors. The Messers. Bechtel also are officials of W. A. Bechtel Co., engineers and contractors.

Offices of the company are maintained at Houston, Wilmington, Bartlesville and San Francisco, with central plants at the former two cities.

NATIONAL METER OFFERS NEW THERMOSTATIC DRUM FILLER . . .

Announcement has been made by the National Meter Division of the Pittsburgh Equitable Meter Co., of a newly designed Empire thermostatic drum filler.

This unit consists of (1) an Empire oscillating-piston, positive-displacement meter; (2) a thermostatic microset for correcting automatically the meter measurement to the exact equivalent of the desired volume at 60° F.; (3) a repeat register with exterior quantity chain having a fixed cam thereon which trips; (4) a mechanically operated control valve with nonfoaming, dripless nozzle of integral construction.



It is stated that changing from one predetermined delivery amount to another is accomplished simply by installing a quantity chain of the proper length on the side of the repeat register. Quantity chains in lengths of from 10 to 100 gal. per cycle can be furnished.

The manufacturer claims the use of this unit will result in a 100 per cent increase in barreling speed over the measure by weight method. It eliminates constant thermometer checking, reference to complicated charts and calculations, and requires no setting and resetting of adjustments for temperature changes.

A new bulletin, N-603, completely describing the Empire thermostatic drum filler, can be obtained from the National Meter Division at 4207 First Avenue, Brooklyn, N. Y.

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WESTERN Kans. & Eastern Colo. 100-000 acres for lease or sale. Terms. Write Owner, John W. Baughman, Liberal, Kans.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

SIX thousand acres oil leases, shallow territory, eight formations; maximum depth sixteen hundred feet will take all oil one thirty seven per barrel; six thousand positively proven gas acreage, growing market; forty strings tools drilling for defense gas in countries East. Want development will share acreage liberally and part of development costs. The Oil and Gas Producing Co., Route 2, Jamestown, Kentucky.

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If we do not maintain a classification exactly suited to the type of advertisement you wish to run we shall be glad to create a fitting one.
Classified Department

300 ACRES ⅞ lease, 10 miles north of Alexandria, La. 50c per acre lease, 50c rental. Between two former gas wells. Would sell 100-acre lease. W. B. Belgard, Rt. 1, Boyce, La.

145 ACRES between Highway 82 and railroad in 31-19-7 MONTGOMERY COUNTY, MISS. on major company seismograph HIGH. 90 day spudding required but deed you farm if no oil here. On ideal shore line structure, eminent geologists state 4 producing sands up to 3500 ft. OIL, 1369 Court, Memphis, Tenn.

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Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

Addresses Wanted

MILES T. McHALE
Anyone knowing the whereabouts of Miles T. McHale, an oil driller, who lived in Tulsa some time ago, please communicate with S. Lipson, 6 Beacon Street, Boston, Mass.

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Tulsa. Oklahoma

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CHEMIST with experience in White Oils and Petroleum Soaps for routine tests. Small Bayonne, N. J. plant. State salary required and history. Box A-850, The Oil and Gas Journal, Tulsa, Okla.

REFINERY ENGINEERS
Excellent opportunities for several capable oil refinery engineers, with old established engineering concern. Should have technical education, with a thorough knowledge of refinery equipment and processes. Salary commensurate with experience and capabilities.
Application should be made by letter, giving age, nationality, concise outline of previous business experience and educational background, present salary, salary desired, and references. Include recent photograph. Ernest Owen, E. B. BADGER & SONS COMPANY, 75 Pitts St., Boston, Mass.

REFINERY DRAFTSMAN—For maintenance and construction work in midwest refinery. Good opportunity for right man. Box A-894, The Oil and Gas Journal, Tulsa, Okla.

Situations Wanted

REFINERY SUPERINTENDENT — 18 years' experience, operation, maintenance, design, construction. Age 40, resourceful, careful, energetic. Box A-880, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Superintendent, desires connections, experienced in the operation, maintenance and construction of modern refining equipment, Cracking, Reforming, Polymerization and Alkylation. Have handled road oils and asphalts. Familiar with Eastern, Mid Cont. and Western Crudes. Box A-890, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM Chemical Engineer, D. Emg., 13 years' experience in control, plant, development and research, including construction, installation, maintenance in the oil refining industry, age 38, married. Desires new connection where abilities can be utilized fully. Box A-893, The Oil and Gas Journal, Tulsa, Okla.

Financing

LOANS made on producing oil, gas and mineral lands. New York Note & Share Corp., 109 Broad St., New York City.

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Business Opportunity

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Equipment Wanted

WANTED: Used Saybolt Chromometer for Gasoline Color Determination. Allied Materials Corp., Cotton Exchange Bldg., Oklahoma City, Okla.

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A NUMBER of 55,000 barrel tanks. Give complete dimensions, weights and specifications: also prices as is and if possible dismantled f.o.b. with pieces numbered and diagrammed. Also interested in other sizes. Box A-891, The Oil and Gas Journal, Tulsa, Okla.

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Series 15-30-60-90 Gate Valves — Flanges — Ells — Tees — Special Items — Control and Relief Valves — Complete Line Cast Iron Valves and Fittings — Send Us Your Inquiries

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W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

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25 K.W. and 40 K.W. Gas Engines, 220 volts. D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.

Terms to suit.

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TWO Murphy Diesel Engines 150 HP. each slightly used, excellent condition. For Sale f.o.b. Houston. 525 Waggoner Bldg., Wichita Falls, Texas.

OKLAHOMA CITY alloyed once run ⅞ & 1" sucker rods
MIKE TRAVIS, 1702 S. Boulder,
Phone 2-2447, Tulsa, Okla.

FOR SALE at Bartlesville: 1 model 1312 photostat machine. Complete $750. Patridge, Cities Service Oil Co., Bartlesvfile, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

FOR SALE: Mast Type casing pulling machine, 50 ft. mast, complete drawworks, perfect working shape. Degen Pipe & Supply Co., 401 N. Boston, Tulsa, Okla.

WESTINGHOUSE Turbine—115 H. P. at 85 lbs. Steam Pressure—Expansion Pressure 5 lbs.—1750 R.P.M. Turbine No. 11,133. Write to James C. Martin, Nixon Building, Corpus Christi, Texas.

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2—31 HP Reid Engines
1—Oil Well Black Bear 25 HP
1—Moore tubular derrick
2—72' Angle iron derricks
Rig irons, sand reels and reversible clutches.

Located Coleman County, Texas.

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W. T. Waggoner Bldg., Ft. Worth, Texas.

1—Complete Big Diesel full electric, direct current rig.
1—Medium size Direct current full electric rig.
4—Rebuilt 120 HP Diesel engines.
1—Rebuilt 200 HP Diesel Engine.
1—Small steam rig.
1—Late Model "S" Cardwell Rig complete. Made 7 holes, same as new and equipped with 6,000 feet of 3½" full hole drill pipe which has made three holes.
3—300# W.P. Boilers, A-1 Condition.

Also stock of new engines.

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Fort Worth, Texas.

TRACTORS

Caterpillar, crawler type, size "35" $495; size "65" with nigger head winch $895; Austin Western hydraulic grader 10' blade $650. O. C. Evans, Mt. Sterling, Kentucky

---

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE near Wewoka, Oklahoma: 2—80 H.P. Type V Foos Gas Engines complete in good operating condition. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE at Bartlesville: 15 oak drafting tables, $35 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

USED
REFINERY EQUIPMENT
With Engineering Service
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BUYERS SERVICE & ENGINEERING CO.
BOX 552 PHONE 2-4441
West Tulsa, Okla.

FOR SALE: 4188' of 6⅝", 24 and 26# Seamless extreme line casing. Critchett & Woods, Olla, Louisiana.

FOR SALE: Complete rotary rig suitable for 3500 ft. drilling. Muskogee Iron Works draw works, powered by 165 H.P. Hercules Motor, 7¼ x 12 Gardner-Denver Pump, powered with R-6-1 Climax engine. 3300 ft. 4½" drill pipe, etc. Price $19,500.00. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE

1240 ft. 7" O.D. 24-lb. Casing.
2911 ft. 2½" U.S. 6½-lb. Seamless Tubing.
2800 ft. ⅞" Sucker Rods.
600 ft. 3" Line Pipe.
1—1000 Bbl. 12-Gauge Steel Bolted Tank.
2—500 Bbl. 12-Gauge Steel Bolted Tanks.
1—250 Bbl. 12-Gauge Steel Bolted Tanks.
1—70 H.P. Donovan Boiler (License for 125 lb. pressure).
1—42 H.P. Model U-10 International Motor.

The motor has been in service for 18 months. The pipe and rods just recently pulled, are in excellent condition and now stacked on location. For prices, phone or wire Ira Blevins or Blevins Welding Co., Texarkana, Arkansas.

WANTED—Used Oil Country boilers. Write us giving complete specifications, condition and location. Lucey Products Corp., Tulsa, Okla.

FOR SALE: One high pressure and two low pressure 45 h.p. oil well boilers, oil field type, perfect condition. Also 100 h.p. Marine type boiler. C. K. Hendricks, Box 805, Taylor, Texas.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

FOR SALE

20,000' 12¾" O.D. lapweld pipe.
5,000' 7", 24 lb. seamless casing.
5,000' 2⅛" seamless upset tubing.
300 sets 3" tool joints, full hole.
200 sets 3" full hole tool joints.
Both steam and power drilling rig. A complete line of drilling and pumping equipment.

Wire, write, or phone the

Louisiana Iron & Supply Company
Shreveport, Louisiana

FOR SALE

Located one-half mile south of Shidler Oklahoma.

3—190 HP. Type 3, New Watts-Miller twin gas engines, complete, with two-stage compressors, direct connected.
2—190 HP. Type 3, New Watts-Miller twin gas engines, complete, with single-stage compressors, direct connected.
3—190 HP. Type 3, New Watts-Miller twin gas engines, not complete.
2—70 HP. New Watts-Miller, Overhead belt-driven auxiliary engines.
Large quantity of new, unused extra parts for 190 HP. New Watts-Miller Engines and Compressors; bearings, pistons, rings, valves, etc.
1—steel building, 222' long x 32' wide.
1—steel auxiliary building, 30' x 32' wide. Both buildings are braced with 6" I-beams.
A number of steel buildings with wood frames.
Large stock of fittings, from 2" including 16", mostly screw.
6,000—8⅝" Dresser sleeve couplings, less bolts and rubbers.
2—size #6 and 1,—size #3 A. C. Cemron Centrifugal Pumps.
1,000' of mesh wire fencing, with barbed wire extensions on top.
2—75 HP. Chicago Pneumatic Engines and Compressors, located near Wewoka, Oklahoma.

If interested, please write

KAHAN PIPE & SUPPLY CO.
P. O. Box 682, Tulsa, Oklahoma
or call 4-6537, Tulsa, Oklahoma.

FOR SALE

MARINE TYPE BOILERS

2—SCOTCH MARINE 180 HP 150# W.P. Boilers complete with Dutch oven, steel building, fire brick, all header connections and stack. In first class condition.

Louisiana Iron & Supply Co.
Longview, Texas

FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

WE CARRY a full line of Drilling and Fishing Tools, Stems, Bits, Spiders, Slips, everything in the drilling line. Degen Pipe & Supply Co., 401 N. Boston, Tulsa, Okla.

FOR SALE: 1 Ft. Worth Spudder, 2500 ft. capacity, and 1 Star Spudder, 4,000 ft. capacity. Both machines now drilling out of Tulsa. O. B. Hausam, 4203 S. Madison, Tulsa. Phone 4-4288.

FOR SALE at Oklahoma City: 1—100 H.P. Kewanee 200# W.P. oil field type boiler. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE

1—Complete Std. drilling rig consisting of:
1—122' Emsco Angle Iron Derrick with 5" re-legs, Steel band wheel, steel bull wheel, steel calf wheel. Parkersburg sand reel.
1—Steel front with steel walking beam.
1—13¼ x 16 Reid twin diesel engine with OCS Jack shaft and clutch mounted on skids.

Above in first class condition having drilled but one well 6500' deep.

Also 1—122' angle iron used Lee C. Moore steel derrick.

FT. WORTH PIPE & SUPPLY CO.
Ft. Worth, Tex., Phone 2-1204.

FOR SALE at Oklahoma City -:- 1—1930 "35" Allis-Chalmers Crawler Tractor, $400.00. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: Surplus equipment, 4 Star Drilling Machines—4 Pipe Threading Machines. Also second-hand pipe, casing and oil and gas well supplies. Lee Morrison Supply Co., Bartlesville, Okla. Tulsa Representative phone 4-3355.

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OIL STORAGE TANKS

3—55,000 Bbl.
1—25,000 Bbl.
5—10,000 Bbl.
3— 5,000 Bbl.
4— 2,500 Bbl.
1— 1,000 Bbl.
2— 750 Bbl.
2— 600 Bbl.
2— 1,200 Bbl. Agitators.

Can be inspected at
Middlesex Refinery Co.
Raritan, N. J.

Address your inquiries to

DULIEN STEEL PRODUCTS, INC.
2280 Woolworth Bldg.
New York, N. Y.
Tele—Cort. 7-4676

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FOR SALE: Dayton-Dowd 6" x 8" Centrifugal with 30 hp., 220 volt motor, 1000 gpm., 90 ft. Deep Well Turbine, 60 gpm., 270 ft. with motor or belt drive. Worthington 4" high pressure rotary. Two belt driven two stage air compressors 340 ft. and 368 ft. at 120 pounds. Bruce-McBeth engine driven 50 KW., 220 volt generator with exciter. 9" x 10" Vertical Single acting triplex plunger pump.

CORKEN PUMP & MACHINERY CO.
206 E. Grand Ave., Oklahoma City, Okla.

ATMOSPHERIC Type Jacket Water Cooler, 5'4" wide by approx. 21' long by 19⅛" deep. Contains 145—1" OD 18-Ga. by 19' Admiralty Tubes. 719 Sq. Ft. of surface. Offered subject prior sale. The National Supply Co., Tulsa, Okla.

POWER RIG COMPLETE

Capable of drilling to 6000'. Now in Kansas. Write 302 Commercial National Bank Building, Phone 3-8601, Shreveport, La.

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FROM
RODESSA REFINERY, SHREVEPORT, LA.

4—320 HP Babcock & Wilcox Stirling type water tube boilers, Class S No. 16 with oil burners, 304 3¼" OD boiler tubes. Last insurance inspection Jan., 1940 approved for 150 lbs. working pressure. One complete set of new tubes for one boiler.

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2—Fairbanks-Morse centrifugal water pumps, 2 stage, driven by Kerr turbines, 25 HP, size 3A, 3,000 RPM.

All in Good Condition and Priced for Immediate Sale

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15,000 to 20,000 ft. 20" O.D., 3/16" Wall .35 - .45 Carbon Steel Pipe P. E. in 50 ft. length good for low pressure line. Also Quantity Dresser Couplings, Ells and other Fittings.

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CALENDAR OF EVENTS

February

AMERICAN PETROLEUM INSTITUTE, Division of Production, southwestern district, spring meeting, Adolphus Hotel, Dallas, Tex., February 26-27.

NORTH TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 28.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week and spring meeting, Cleveland, Ohio, March 2-5.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners and suppliers exhibit, Hotel Severin, Indianapolis, Ind., March 3-5.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, Calif., March 10.

WISCONSIN PETROLEUM ASSOCIATION, annual convention and equipment show, Schroeder Hotel, Milwaukee, Wis., March 18-20.

OKLAHOMA UTILITIES ASSOCIATION, annual convention, Biltmore Hotel, Oklahoma City, Okla., March 23-24.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, spring meeting, Houston, Tex., March 23-25.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent district, Mayo Hotel, Tulsa, March 26-27.

April

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 9-10.

MIDWEST POWER CONFERENCE, annual meeting, Palmer House, Chicago, Ill., April 9-10.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Cincinnati, Ohio, April 15-17.

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth semiannual meeting, Cleveland, Ohio, April 16-17.

AMERICAN CHEMICAL SOCIETY, 103rd meeting, Memphis, Tenn., April 20-24.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, Norman, Okla., April 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-seventh annual meeting, Cosmopolitan Hotel, Denver, Colo., April 21-24.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Washington-Youree Hotel, Shreveport, La., April 22-24.

May

AMERICAN GAS ASSOCIATION, thirty-seventh annual natural-gas convention, New Orleans, La., May 4-7.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Mayo Hotel, Tulsa, May 13-15.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

June

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

October

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

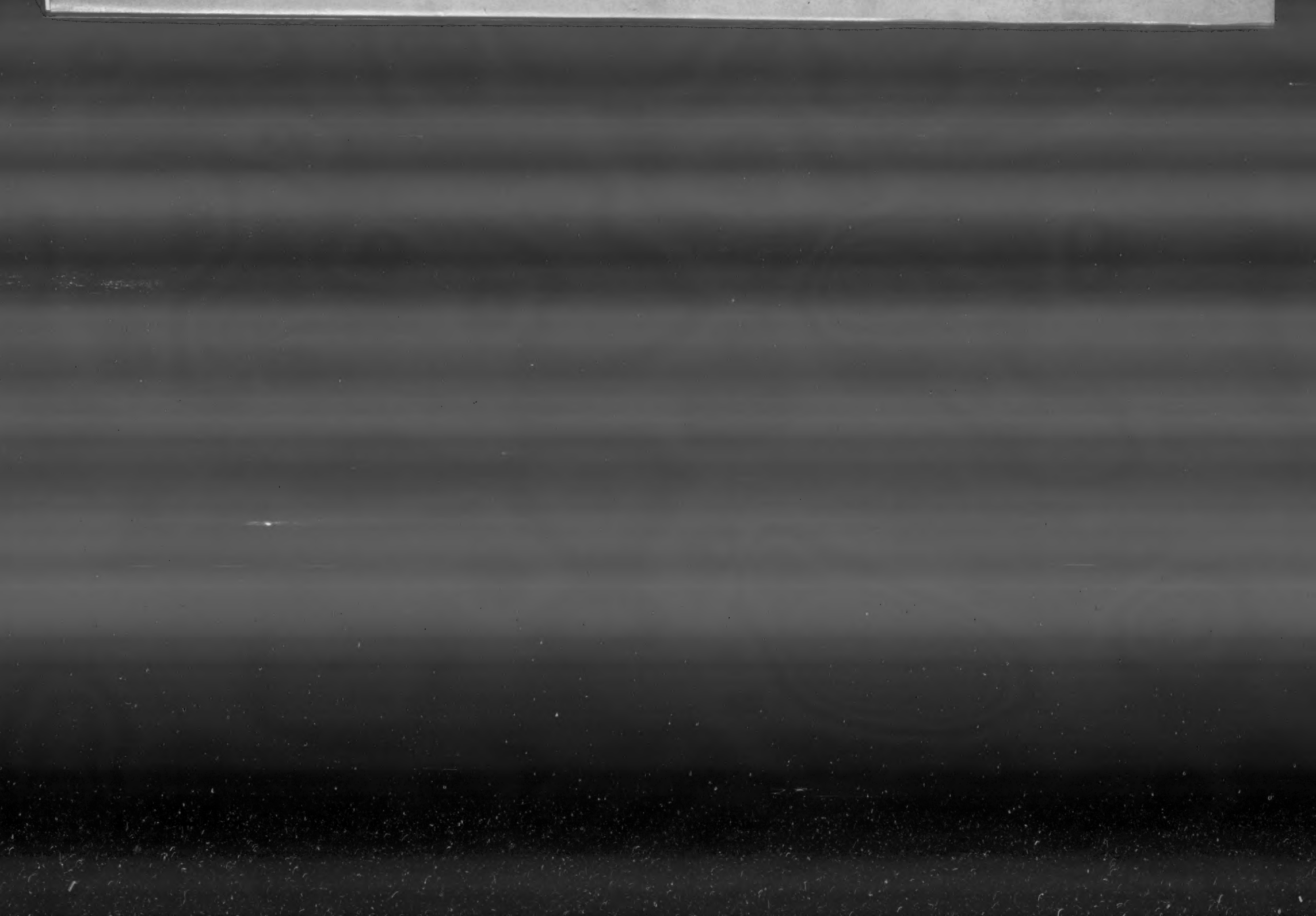
AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

NATIONAL CHEMICAL EXPOSITION AND NATIONAL INDUSTRIAL CHEMICAL CONFERENCE, annual meeting, Stevens Hotel, Chicago, Ill., November 17-22.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York City, November 30-December 4.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.



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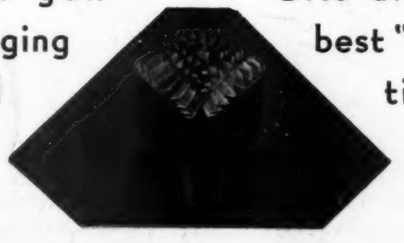

Built for speed in cutting thru varying formations, Hughes Tailor-Made Rock Bits are the Driller's best "weapon" against time in drilling for oil.....

Hughes Tool Co., Houston, Texas

61% of all Safety Directors Say— "Use Preformed Wire Rope to Reduce Accidents"

EXCERPT FROM PAGE 62, Dec. 1941 "NATIONAL SAFETY NEWS"

Preformed Rope Reduces Injuries

Preformed rope, according to returns from the questionnaire, has been adopted by many companies in order to avoid barbs caused by ends of broken wires. Preformed rope does this in two ways: first, the wire ends do not stick out from the rope when the wire breaks, but continue to lie in position against the rope body; and second, the high resistance of preformed rope to fatigue results in fewer wire breaks developing in a working rope, all other things being equal.

"Buy only preformed rope," cautions the safety engineer of a large automobile company, "since it is safer and cheaper in the long run." The safety officer of a federal government agency says, "There is far more likelihood of workers receiving puncture injuries while handling non-preformed rope than from the preformed type." A metal mine reports that their injury rate and compensation costs due to hand injuries from handling slusher ropes dropped to almost zero when they changed to preformed rope, and two other mines corroborated this report from their own experience. A rubber company says, "We definitely favor preformed rope." Other companies report similar experience.

AMERICAN CABLE

TRU·LAY *Preformed*

When asked, in a survey, how to reduce accidents to workmen handling wire rope, 61% of all Safety Directors of oil companies said: "*Use Preformed Wire Rope.*" American Cable **TRU-LAY PREFORMED** wire lines mean faster round trips, steadier drilling, fewer replacement purchases. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

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ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*